PUBLIC ABATTOIRS

THEIR PLANNING, DESIGN & EQUIPMENT

R. STEPHEN [illegible] F.R.I.B.A.

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BY

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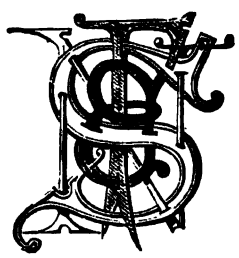

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PREFACE.

THIS work has been written with the object of not only advocating a general "abattoir system," but also to demonstrate that public abattoirs are an absolute necessity rather than a luxury.

I have endeavoured to prove that they are demanded in the cause of humanity, that they undoubtedly tend to decrease disease and mortality, and that they can, and should be, made self-supporting or profitable.

The subject has hitherto been so little studied in England that it is hoped this work may be useful in aiding municipal and other authorities, contemplating the erection of new abattoirs.

Almost without exception a request for the loan of drawings, or for information, frequently entailing a large amount of labour, has been met with a ready and willing response. In many cases sets of contract drawings, and valuable documents have been placed at my disposal, or copies of them supplied by borough architects, engineers, etc.

Where so many have been equally helpful, it would be invidious to mention names, but I take this opportunity of thanking the many gentlemen in my own and kindred professions who have so kindly aided me, individually and collectively.

R. STEPHEN AYLING.

8 DARTMOUTH STREET,
WESTMINSTER, S.W.
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PUBLIC ABATTOIRS.

CHAPTER I.

INTRODUCTION.

THE necessity for closing private slaughter-houses, and erecting public abattoirs to take their place, not only in London, but throughout the United Kingdom, has for many years been discussed by the London County Council and by Local Authorities.

To-day we have about 135 such buildings scattered over the country, a few good in planning, others indifferent, and the great majority bad. No attempt has been made to institute an "Abattoir System" such as that started nearly a century ago on the Continent, and which has since rapidly grown and approached perfection.

To a large extent this is accounted for by the fact that taking the life of any animal must necessarily be repulsive, even under the most humanitarian conditions; but surely it is an idle fallacy, whilst the necessity exists, to bury one's head in the sand, and endeavour to forget that, for humane, hygienic, and economic reasons, animals should be killed in such places, and by such methods, as to insure these conditions.

At the present time we have 318 private slaughter-houses in London alone, mostly in a terribly insanitary state, and where in many of them cruelty exists, and prodigious waste of valuable material is incurred owing to the want of concentration.

The English private slaughter-houses are subject to no uniform system of inspection, so that many tuberculous and otherwise diseased animals are killed, the carcases prepared, and continually sent to the market between the very infrequent visits of the sanitary inspector. Such conditions would not be tolerated on the Continent.

Experts on the subject differ somewhat as regards the degree of danger

to man through eating the flesh of tuberculous animals, but it is universally acknowledged that the sanitary conditions and facilities for uniform inspection obtained in the public abattoir, minimise this risk, and would tend eventually to practically stamp out tuberculous disease in cattle.

It has hitherto been a somewhat debatable point as to whether human and bovine tuberculosis are identical. Mr. Arthur Eastwood, M.D., was appointed by the Royal Commissioners on Tuberculosis to investigate the matter by experiment and research. This work has occupied about four years, and in his report recently issued he states: "There is an essential unity, not only in the nature of the morbid processes induced by human and bovine tubercle bacilli, but also in the bacteriological characteristics of the tubercle bacilli which cause these processes."

In 1898 His Majesty the King (then Prince of Wales) held a meeting at Marlborough House to further the objects of the National Association for the Prevention of Consumption, and occupied the chair. Sir William Broadbent (chairman of the Association) most emphatically stated that public slaughter-houses were necessary, so that the inspection of carcases could be carried out before the evidence of disease could be removed. In his reply His Majesty stated that our late beloved Queen gave authority that thirty-six of her dairy cows at her Home Farm, which on being tested with tuberculin were found tuberculous, were to be destroyed.

In England the annual expenditure on hospitals and sanatoria, erected with the object of endeavouring to cure persons suffering from tubercular diseases, is enormous, and yet practically no effort is made and no expense incurred, in trying to prevent it. From a humanitarian point of view there can be no question as to the many advantages of the public abattoir. One witness before the Commission in 1904, said that, as regards slaughtering, he thought it should not be left to any "odd and end man who could be got to do it;" another witness was rather proud of the fact that he had killed his first bullock before he was twelve years old; another gave evidence that "a man full of beer often does this work;" whilst one witness stated that he was told by a man whom he could trust, that, when a boy, his father (a butcher) told him "to go and kill a sheep," and on asking "How am I to do it?" he was told to kill it in the best way he could, and the witness added, "I daresay he wanted to blood the boy." Such unspeakable barbarities are impossible in the public slaughter-house.

Whenever public slaughter-houses are proposed in this country, the butchers, cattle breeders, and agriculturists, through the representatives of their various societies and associations, bitterly oppose their erection. The main grounds of opposition are—

1. Owing to proper inspection, much more meat would be condemned as unfit for food than is now the case.

2. They claim compensation to be paid for animals condemned as unfit for food, contending that the carcases would be destroyed for the public good; and

3. That monetary compensation should be paid to butchers for compulsorily closing their private slaughter-houses.

These matters will be dealt with in future chapters.

Exactly the same objections to public abattoirs were offered by the butchers on the Continent many years ago, and, happily, successfully overcome. Another argument brought forward by the Trade is that public abattoirs do not pay. This question will also be considered later, and from the tables given it will be seen that nearly one-half of the existing public abattoirs in the Kingdom yield a financial profit. This is really remarkable, as we have, at present, in England practically no statutory powers to close private slaughter-houses, and therefore, in those towns where public abattoirs have been built, they are mostly in competition with the butchers killing cattle in private slaughter-houses close to, or adjoining their shops. Doubtlessly, from the butcher's point of view, this is a most convenient arrangement; and as one witness before the Royal Commission (1904) stated that in the city in which he resided previously to the building of a public abattoir a few years ago (and to-day without compulsory powers to close the private slaughter-houses), "the butchers preferred to slaughter on their own premises, and actually, if they could, in their own back parlours. Many of them killed their sheep and other animals of this kind in their own back parlours." In 1896 a Royal Commission was appointed by our beloved late Queen, to inquire into the "danger to men through the use as food of the meat and milk of tuberculous animals," and the report of the Commissioners based on the evidence of fifty-five witnesses was presented to the House of Parliament in 1898. They were composed of Medical Officers of Health, Veterinary Inspectors throughout the Kingdom, representatives of Agricultural and Butchers' trade societies, officers of the Local Government Board, London County Council, etc. The report issued by the Royal Commission was most emphatic on the question of the many advantages of public slaughter-houses, and the compulsory closing of the private slaughter-houses, both from a hygienic and humanitarian point of view. Of the twenty-six witnesses examined on this subject, twenty-three were strongly in favour, and only three adverse. Of the three witnesses expressing adverse opinions, one did so only on the question of cost, another thought that the establishment of public abattoirs would tend to increase the sale of foreign meat (as more rigorous inspection would lead to the condemnation of diseased carcases); and yet another objected to any official inspection of meat in

general. It is noteworthy that these last two witnesses were representatives of trade Societies.

In 1904 a Commission was appointed by the Admiralty to consider "the humane slaughtering of animals," and the Commissioners' report was presented in the same year. About twenty witnesses were examined, including Veterinary Surgeons, Master Butchers, Government Officials, Representatives of Trade Societies, Officers of the R.S.P.C.A., and also butchers and private individuals who had made a practical study of the subject.* The report of this Commission was also most strongly in favour of the erection of public abattoirs, and the compulsory closing of private ones. Seven witnesses were examined as to the desirability of establishing public in the place of private slaughter-houses, and each expressed his opinion in favour of the former. In 1898 the London County Council instructed their architect, the late Mr. Thomas Blashill, F.R.I.B.A., to visit and report on the abattoir system in Germany. This gentleman most emphatically stated that, from every point of view, public abattoirs were not only desirable, but a necessity. In the same year Sir Shirley F. Murphy, Medical Officer of Health to the London County Council (one of the Commissioners on the Tuberculosis Commission) presented a report to the Council dealing exhaustively with the arguments of "the trade" against public slaughter-houses. As he points out, similar objections were raised when the Deptford slaughter-houses for foreign cattle were proposed, but lapse of time has proved that these objections were without foundation. The Deptford market has proved a success, not only to the Corporation of the City of London, but has contributed in an important degree to the foreign meat supply of the whole of London, while the private slaughter-houses have continually decreased in number. Those engaged in the meat trade fell into line with the new conditions, and will again do so when public abattoirs are generally established, to the great pecuniary advantage of the British farmer, and the hygienic advantage of the British consumer.

In 1874, we had in London alone 1429 private slaughter-houses, whilst to-day there are still 318, but happily a diminution on the average of more than 33 per annum.

In 1898 a broad and comprehensive scheme was formulated by the London County Council, viz.: to establish six large public abattoirs around London, in which all home-grown cattle for the London market should be killed, and to gradually close the private slaughter-houses. The sites had been carefully selected, each in close proximity to a railway. No London butcher would have had to cart his meat a greater distance than three miles. Had this scheme been carried out, one of the greatest hygienic reforms of the century would have been

* See Appendix B.

accomplished. But trade opposition was successful in getting the matter pigeon-holed for the time being.

Without wishing in the slightest degree to unduly exaggerate the dangers of our meat supply from country districts under existing conditions, the following extract may serve to show that the country private slaughter-houses are as dangerous to the community as those in the Metropolis. In 1906 the "Daily News" published a letter addressed to Dr. Cooper, M.P., by a distinguished veterinary surgeon in the West of England, as follows:

"I have a country practice" (this gentleman wrote), "and what one sees is terrible. There are a certain class of butchers known as screw butchers. These people visit all the farms, generally in splendid turnouts, and they buy up all the dying and diseased cattle they can. They refuse well fed cattle when offered, because the others, of course, are cheaper. At night they send round a cattle float, well filled with straw, and off go the awful beasts to private slaughter-houses. I am confident most of the meat gets through."

Thus in the twentieth century the private slaughter-house still flourishes throughout the kingdom, with its attendant evils of danger to health, gross cruelty to animals (doubtlessly less from malice, than the ignorance and inexperience of the slaughterers), its haphazard method of inspection, and its enormous waste of valuable by-products. Not only are live animals driven or carted through the streets to the slaughter-houses, but carcases are conveyed in open vans, and blood and refuse pass through the sewers of the greatest city of the world. As a proof of our indifference, in 1893 England provided 100*l.* for research into the value of the tuberculin test, while in the same year Denmark provided 2812*l.* for the same purpose for five years, which sum has since been increased to 5625*l.*

The best method for slaughtering various animals for food in the most humane and practical way, is beyond the scope of this volume, but it will be necessary to briefly refer to these matters, and also to the pain felt, or fear exhibited by the animal at the smell, or sight of blood, and to the important subject of an animal being distressed at seeing another killed. Whilst some witnesses before the Royal Commission thought they are quite indifferent to all, or either, of these matters, the large majority hold perfectly different opinions. These details very closely affect the planning and the equipment of the public abattoirs, which one can only hope will be eventually instituted throughout the United Kingdom, as they have been on the Continent for many years.

CHAPTER II.

POWERS OF LOCAL AUTHORITIES TO CLOSE PRIVATE AND ERECT PUBLIC SLAUGHTER-HOUSES.

THE provisions of the Towns Improvement Clauses Act 1847, which are incorporated with the Public Health Act 1857, by sec. 169 of that Act, draw a distinction between slaughter-houses in use and occupation at the time of the passing of "The Special Act,"* and so continued ever since, and slaughter-houses not in such use and occupation. The owner or occupier of a slaughter-house of the former class must have registered such slaughter-house under the provisions of the Act (sec. 127). Every person who wishes to use a slaughter-house of the latter class, must, under penalty, first obtain from the local authority a licence for the erection thereof, or for the use and occupation thereof (sec. 126), and the Act provides that: The duration of the licence can only be limited where sec. 29 of the Public Health Acts Amendment Act 1890 is in force in the district, and the local authority has exercised the power conferred by that section. In that case, the licence may be limited to any period, not less than twelve months as specified. But in any case, when a person is convicted of an offence under sec. 129 of the Act of 1847, the justices may suspend or revoke the licence granted to him, or in the case of a registered slaughter-house, may forbid the owner or proprietor either absolutely or for a period not exceeding two months to slaughter cattle therein.

Absolute revocation of a licence or prohibition to slaughter is only practicable on second conviction, and, on second conviction, the urban authority may refuse to grant any licence whatever to a person whose licence has been revoked, or on account of whose default the slaughtering of cattle in any registered slaughter-house has been forbidden.

Further, in districts where sec. 31 of the Public Health Acts Amendment Act 1890 is in force, the licence of any occupier of a slaughter-house may also be revoked by a court of summary jurisdiction, on conviction for selling or exposing for sale, or having in his possession or on his premises, meat unfit for food.

* The expression "The Special Act" is defined by sec. 2 of the Towns Improvement Clauses Act 1847 to mean "Any Act which shall be hereafter passed for the improvement or regulation of any town or district, or of any class of town or districts defined or comprised therein, and with which this Act shall be incorporated."

Some few cities and towns have obtained private Acts enabling the authorities to close private slaughter-houses on payment of compensation. In some cases these powers have been exercised, whilst in others the outlay has been deemed unadvisable, and the authorities have not faced it. For instance, at Leicester, eighteen private slaughter-houses exist to compete with the public one. It is surprising that even under these adverse circumstances, the Leicester Public Abattoir is a financial success.

But, taking the case of England and Wales generally, it would appear that, previous to the passing of the Public Health Acts Amendment Act 1890, and apart from the question of actual nuisance, local authorities possessed no powers under the general law to close private slaughter-houses, even when, in the exercise of their powers under sec. 169 of the Public Health Act 1875, they themselves provided slaughter-houses.

In rural districts other than those where the necessary urban powers have been put into force by order of the Local Government Board, slaughter-houses are not required to be registered or licensed by the rural district council; and in rural districts, when the council have obtained the urban powers referred to, the date which distinguishes between places requiring registration and those in respect of which a licence must be obtained, will be that on which the powers come in force.

In the County of London (exclusive of the City) application must be made to the London County Council for a licence to use any place as a slaughter-house (Public Health (London) Act 1891). Such licence may be suspended or revoked by summary order of a court of summary jurisdiction, as a penalty for breaking the by-laws as to slaughter-houses.

Regarding London, there are no special Acts under which the metropolitan borough authorities can erect public abattoirs, although for some years past this question has been discussed, and any proposal to obtain parliamentary powers rendered abortive by the opposition of those connected with the butchering trade.

In the City of London application must be made to, and sanction obtained from the Common Council for establishment of any new slaughter-house.

In London during the last few years some hundreds of private slaughter-houses have been closed, but about 318 still exist, therefore the London County Council must consider every application for renewal of licence on its merits, and can only object to the renewal if it is considered the use of the place as a slaughter-house is objectionable or undesirable.

During the last nine years about fifty-six urban authorities in England and Wales have applied to the Local Government Board for loans, in order to erect (or improve existing) public slaughter-houses, and a large number have obtained sanction and successfully executed the work.

In Scotland the Commissioners are empowered under the Burgh Police (Scotland) Act 1893 to erect public abattoirs and to borrow the necessary sum on the security of the Burgh General Assessment and the rates. As an example, in the City of Edinburgh the charges made for slaughtering in the public abattoir are regulated every three years, and the surplus or deficiency on the slaughter-houses account on the close of each period of three years, is considered in fixing the rates of dues for the succeeding three years.

In Ireland the powers of the local authorities are practically similar to those in England.

The Public Health (Ireland) Act 1878 empowers any urban authority to provide public slaughter-houses and to make by-laws and regulations as they may think fit.

The slaughtering of foreign cattle imported into England is regulated by the Diseases of Animals Act 1894. It is there enacted that foreign animals shall be landed only at a port sanctioned by the Board of Agriculture, and, except in specified cases, slaughtered at the port of landing.

The following are notes from Acts relating to this subject:—

The Markets and Fairs Clauses Act, 1847.—Section 17 provides that undertakers empowered under any special Act "may erect on any land purchased by them under this or the special Act, or any Act incorporated therewith, any buildings or set apart and improve any buildings belonging to them, for the slaughtering of cattle," and it is also enacted that notice of the fact must be given in the newspaper circulating within the limits of the special Act, and also that bills shall be posted in conspicuous positions in the said limits. The above only applies when this section is incorporated in a local Act.

Section 19 provides for a penalty upon any one slaughtering cattle or dressing for sale any carcase in any place within the limits of the special Act, other than in a slaughter-house which existed at the time or previously to passing the special Act.

The Public Health Act, 1875.—Section 169 provides that, "Any Urban Authority may, if they think fit, provide slaughter-houses, and they shall make by-laws with respect to the management and charges for the use of any slaughter-house so provided." These by-laws are subject to confirmation by the Local Government Board.

A case of great interest, bearing on the subject of licensing (Goodwin *v.* Sale) was tried in Leominster on October 11, 1906 (for report see "Times," April 19, 1907, 71 J. P. 303 (1907) 2 K.B. 278). This decision establishes the fact that a licence is granted to a "person" not to a "place," and is of great importance to Local Authorities in regard to the question of further licensing on the death or retirement of a person previously using or occupying the premises as a slaughter-house.

CHAPTER III.

NEED FOR PUBLIC ABATTOIRS.

THAT public abattoirs are an imperative necessity was recognised by the Continental nations over a century ago—not only on hygienic and humanitarian grounds, but also from an economic point of view. It is true that we have to-day some public abattoirs scattered over the kingdom, but very few of them satisfactorily planned, and those which do exist are absurdly inadequate for national requirements. Doubtlessly this deplorable state of affairs is to some extent due to want of knowledge rather than indifference.

Although medical men, sanitarians and humanitarians have for many years past made strenuous endeavours to alter the existing system (or rather, the want of system), the public press, almost without exception, prefers to devote its columns to the delectable details of the Divorce Court or Old Bailey. The question of slaughtering animals for food is not one to be handled in kid gloves and evening dress, and although much has been written on the subject, such literature only falls into the hands of a limited number of persons particularly interested in the subject, and then only in the form of pamphlets with a comparatively small circulation.

In an article recently published in the "Liverpool Courier" it is stated: "Only vegetarians and public health officers are really interested in abattoirs. The average man who believes with an eminent publicist, that 'the hand that carves the sirloin rules the world,' must forget the intervening stages of the sirloin's evolutionary progress from the country meadow to the dining table. No, there are more attractive things to read about than slaughter-houses." The writer then apologises for bringing such a subject before the public, and states that he does so from "sheer pressure of civic necessity." This attitude recalls to one's mind the lines in "King Henry IV."—

> "And, as the soldiers bore dead bodies by,
> He called them untaught knaves, unmannerly,
> To bring a slovenly, unhandsome corse
> Betwixt the wind and his nobility."

I agree with the writer's comment that there are "more attractive things

to read about than slaughter-houses," and unfortunately, that is the reason why in England the average citizen knows nothing, and cares nothing about them. But I deny that "only vegetarians and public health officers are interested in the subject." Some years ago this probably was a fact, but to-day there are many thousands of persons other than vegetarians, keenly interested in the question, some on purely humanitarian grounds, some on hygienic grounds, and the greater majority on both.

In 1906 the following memorial was addressed to the London County Council by the Humanitarian League, through Sir W. J. Collins, M.P.: "In view of the recent declaration by the Public Health Committee of the London County Council that they are strongly of opinion that authority should be sought from Parliament to enable the Council to substitute public slaughter-houses for the private ones in use in the County of London, we desire to express our earnest hope that the Council will take the necessary steps to give effect to this much-needed but long-delayed reform. . . ." This memorial was signed by 100 ladies and gentlemen. The signatures included those of eminent persons engaged in nearly all the various branches of the arts and sciences, of every shade of religious and political opinion, as wide asunder as the poles, and yet united in their views on this particular matter.

The Society for the Prevention of Cruelty to Animals undoubtedly does excellent work in many directions, and one naturally rejoices to read in the daily papers that a cruel cabman or a brutal carman has received adequate punishment through the prosecutions instituted by this society. But how often does one hear of a slaughterman being charged with cruelty in a private slaughter-house? No record is kept by the London County Council, or the Local Government Board, of the number of animals killed in the private slaughter-houses in the kingdom, but they number many thousands per week.

It is stated in the "Builders' Journal" (December 21, 1898), that in London alone between 10,000 and 11,000 animals are slaughtered every week, in addition to those dealt with at Deptford and Islington.

It is undeniable that a large number of acts of cruelty are perpetrated, I believe, through want of training rather than wanton brutality. However, "private" slaughter-houses are "private" property, and even the officers of the R.S.P.C.A. are only admitted by permission of the owner of the premises. The public slaughter-house with inspectors continually about the place, and with its staff of well-trained and expert slaughtermen, undoubtedly tends to reduce to a minimum the risk of an animal being tortured or ill-treated. In 1897 I spent a month in the abattoirs of La Villette, Paris, and during that time, I am pleased to say, I never saw an animal kicked, its tail twisted, or any unnecessary force used

either in the cattle markets or slaughter-houses. The "familiarity which breeds contempt" was conspicuous by its absence, and I fully believe this happy result is owing to the employment of well-trained and expert workmen under strict surveillance in buildings well planned and equipped.

The authorities of those towns and cities where public abattoirs have been erected during the last half century may justly claim to be pioneers, although many of these buildings are now quite out of accord with modern ideas, but even so they are infinitely preferable to the private slaughter-houses.

In England we are proud of the great strides made during the last 50 years in sanitary science, and yet we still have the unenviable reputation of practically ignoring one of the most important hygienic reforms, viz., the killing of animals under sanitary conditions, and the proper inspection of meat before it is sold as food.

From a humanitarian point of view a separate volume might be written, but the horrors of the private slaughter-house have been frequently published in pamphlets, and at intervals in articles and letters in a few of the daily newspapers.

To counteract the ill effects of the private slaughter-house, with its attendant evils of cruelty to the animals slaughtered, cruelty perfectly preventable, and mainly due to the lack of experience and training of the slaughtermen, to prevent the sale of diseased meat through lack of adequate inspection, and to prevent the enormous waste of valuable material through the lack of concentration, public abattoirs are the only possible remedy.

To the Humanitarian League the greatest credit is due for its persistent and consistent advocacy of the public abattoir. Through the publications of this society a large amount of good has already been accomplished, and an even greater amount will be effected in the near future. Many pamphlets have been issued by the League which deal convincingly and conclusively with the humanitarian side of the question. In the pamphlets written on "Slaughter-house Reform" by the Rev. John Verschoyle, the following paragraph occurs: "To remedy the evils of the slaughter-house, and the allied evils of sea-borne and inland cattle trade, would be not only to discharge a manifest moral duty of the community, but also to consult the interests of the bodily health of the nation, which interests are endangered by the facilities for the slaughter of diseased animals and the sale of their meat which the private slaughter-houses afford. Any slaughter-house reform, which merits the name of reform, must be built up gradually on one foundation, and that is the establishment of public abattoirs, and the abolition of private slaughter-houses."

A vivid pen-picture of the Aldgate slaughter-houses is given in the Journal of the Humanitarian League in July last. "The approach to the back entrance

of one of these dens was almost enough to condemn the whole. A dirty back street on a hot summer day, the ground covered with horse-dung and vegetable refuse, and stinking to a degree very objectionable to the uninured nostril, was the approach on which opened the door of a tumble-down erection in which, we were told, the meat was to be hung, to be kept till used. At one door, a van had just been unloading calves, and three boys and a girl about 14 years old were craning their necks to see what they could of the process."

Happily, our private slaughter-houses, objectionable as most of them are, are not generally so bad as this, but that such places should exist at all in the heart of the City of London cannot be otherwise than a national disgrace.

Before the Royal Commission on Tuberculosis (1898), as previously stated, twenty-three out of twenty-six witnesses who were asked their opinion on the necessity of public abattoirs, expressed strong views as to the imperative need. Doubtlessly the opinion of these witnesses would carry less weight were they simply those expressed by scientists, but they embrace the views also of men thoroughly conversant, not only with the scientific, but also the practical side of the matter.

The question whether public abattoirs were, in the opinion of the witnesses, desirable or necessary, was answered as follows by a few of the gentlemen examined.

Dr. W. S. Saunders, M.O. of H. to the City of London.	Undoubtedly necessary.
Dr. W. A. Bond, M.D., M.O. of H., Holborn .	It is exceedingly desirable in my opinion to have Public Abattoirs. All large towns certainly ought to have Public Abattoir.
Sir C. A. Cameron, M.O. of H., Dublin . .	Undoubtedly. Every town of a few thousand inhabitants I think ought to have an Abattoir.
Dr. F. Vacher, M.O. of H., Chester . . .	Public Abattoirs should be established, and after a short time entirely take the place of private slaughter-houses. I certainly believe in them very much.
Dr. S. Gourley, M.O. of H., West Hartlepool .	I look upon Public Abattoirs as a great boon to the public and safety for them.
Mr. B. St. John Akers, Chairman of the Cattle Disease Committee, Central and Associated Chambers of Agriculture.	I am in favour of Public Abattoirs.
Mr. J. Scarlett, Sec. Paisley United Fleshers Society.	Hold need for Public Abattoir very strongly. I would have a penality for killing in any place but a public slaughter-house.

Mr. C. Stevenson, F.R.C.V.S., Vet. Inspector for City of Manchester.	I think it is most important. One of the most important questions of the day. There should be Public Abattoirs, and they should be compulsory and uniform all through the United Kingdom.
Mr. G. J. Ward, Pres. Nat. Federation of Butchers and Meat Trade Associations.	Yes, on the question of tuberculosis.

Such expressions of opinion could be multiplied almost indefinitely.

In the report of the Commissioners appointed by the Admiralty in 1904 to consider "The Humane Slaughtering of Animals," the following paragraph occurs:

"In the interests not only of humanity but of sanitation, order, and ultimate economy, it is highly desirable that, where circumstances permit, private slaughter-houses should be replaced by public abattoirs, and that no killing should be permitted except in the latter under official supervision. Such a change as this could be only brought about gradually by legislation, but it cannot be described as impracticable in view of the fact that this system is prescribed by law in several Continental countries, and is actually enforced in the City of Edinburgh."

Not the least of the arguments against private slaughter-houses is the demoralising effect they have on children of both sexes. In London and perhaps more frequently in the country, they abut on public thoroughfares. I can recall one instance where, until a few years ago, a private slaughter-house was situated in a somewhat busy thoroughfare in the heart of the City of Westminster. The doors were frequently open or ajar, and it was quite customary to find a number of children watching the slaughtering operations, fascinated by the sight of blood and the struggles of the animals.

Mr. Grant Henry stated in his evidence before the Admiralty Committee that it is a daily occurrence for all the children in the village to look on whilst slaughtering was in progress, but, he added, they do not allow children to go as a rule.

Another most important factor in the establishment of public slaughter-houses is that they inevitably tend to improve the moral status of the slaughtermen.

In the private slaughter-houses, practically without inspection, it is not surprising that cruelty often flourishes unchecked. In the public abattoir, the strict inspection, and also the work being carried on in the fierce light of publicity, must tend to diminish cruelty. By "publicity" I do not mean that the Institutions should be open for any one to visit them as and when they wish, but it should be made quite possible for any ratepayer, or indeed any person interested in the subject, to obtain an order and be conducted over the buildings by a competent

guide. Also the well-ventilated, cleanly and properly equipped public slaughter-house must render the work less repulsive to the slaughtermen than when it is conducted in ill-ventilated, ill-lighted and insanitary buildings.

Mr. C. Cash, B.A., in his excellent book "On Slaughter-house System" quotes from a lecture delivered by Sir Richard Thorne:

"The properly administered public slaughter-house is demanded as an act of justice to those trading in meat; it is demanded in the interests of public health and decency; and it is demanded to bring England, if not the United Kingdom, somewhat nearer the level of other civilised nations in this matter. Public slaughter-houses officered by skilled inspectors, and supervised by medical officers of health, are urgently required, among other reasons for the prevention of tuberculosis."

Perhaps one of the most ardent advocates for the public abattoir was the late Sir Benjamin Ward Richardson. As President of the Model Abattoir Society, his great knowledge and untiring energy would have been very fruitful, but on his decease, and also the death of Mr. H. F. Lester (the Hon. Secretary) in the same year, the influence of the society was somewhat curtailed. Happily, however, recently, Sir James Crichton-Browne, M.D. LL.D. F.R.S., consented to act as President, and Mr. Bertram Richardson as Secretary. Under these conditions, the work of the society will now be carried on with renewed energy.

From the reasonably equipped private slaughter-house, more or less sanitary, to the dilapidated sheds (often in congested districts) where animals are slaughtered, there is naturally a wide difference, but the whole system is bad in principle, and worse in detail.

Theoretically, in London, we have a system of meat inspection, but it may be interesting to see how it really works in practice. Medical officers of health and sanitary officers have legal power to enter a private slaughter-house at any time during working hours, and, *prima facie*, this arrangement should prevent the sale of diseased meat, and also insure that the animals are killed without any unnecessary pain or suffering. But it is not possible for these officers to visit our scattered private slaughter-houses except at long intervals, whilst in public abattoirs they are continually on the spot. As an example, three years ago an English city possessed 110 private slaughter-houses with only two sanitary inspectors to inspect the buildings and the carcases of meat prepared for sale. Obviously it would be beyond the power of these two officers to perform their duties efficiently.

Not only are our sanitary inspectors generally, through lack of training, perfectly unfit for this particular branch of their work, but, even if they were, our scattered private slaughter-houses render adequate inspection physically impossible.

In the report of the Royal Commission on Tuberculosis it was stated that in one London borough the posts of Sanitary Inspectors were filled by four men trained as plumbers, and three as carpenters, while in another borough a carpenter, compositor, bricklayer, florist, builder, surveyor, and stonemason were appointed to perform these duties. In another large English city, the sanitary inspectors were appointed as follows: a butcher, three school teachers, a medical dispenser, carpenter, and tram-conductor. It is difficult to imagine how men with training in the above trades or professions could be expected to efficiently discharge their duties as sanitary inspectors.

The greatest expert is quite incapable of tracing signs of tuberculosis in a carcase after it has been dressed and cooled, unless he has an opportunity of examining the viscera at the time of killing. In the private slaughter-house this is impossible for two reasons: that the sanitary inspectors only see generally a very small number of the animals slaughtered, and also, even if they happen to be present when killing is in progress, the whole of the offal is thrown aside and cannot be identified as being taken from any particular animal.

Great as is the difficulty in detecting tuberculosis in a carcase after it has been dressed and cooled, it is nearly impossible even for the expert veterinary surgeon to do so whilst the animal is standing in the market prior to being sold.

Professor J. MacFayden stated before the Tuberculosis Commission that "an animal may be tuberculous to a degree that would entail the total confiscation of the carcase, even under the system of partial seizure, and that animal has passed for healthy up to the time of slaughter."

Another witness, Mr. W. Haydon, a member of the London County Council, president of one, and vice-president of another butchers' trade association, who stated he was "born in the trade," gave evidence that on one occasion he examined a living cow which was as fine a specimen as he ever saw, but on its being killed he said "he never saw one so badly tubercled before. The whole of the lungs, the liver, the spleen (which are generally free, I never saw one affected in the spleen before), the whole of the entrails, and the external fat were one mass of tubercles. Both sides of the chest were badly gaped, and also the walls of the stomach, and the diaphragm very badly." On examining the man who had been looking after the animal, he said that, before killing, the animal seemed as "healthy and active as possible." Mr. Haydon added, "I never saw such a mass of disease in my life." Doubtlessly this carcase would have been sold for food if the animal had been killed in a private slaughter-house.

From an economic point of view, the public abattoirs are doubtlessly an enormous gain. In the private slaughter-house, where perhaps only a few animals are killed during the week, how is it possible to fully utilise all the valuable

material which in England is generally wasted? Blood is allowed to drift into the public sewers. In Paris this is all carefully collected and used for various purposes, viz. for the manufacture of manure, dyes, albumen, etc. In England the skins, hoofs, horns, etc., are generally stored in the private slaughter-house for an indefinite period and are then bought and collected at long intervals by those who use such articles in their several trades.

Who in London is not unfortunately familiar with the sight of open vans conveying these articles through the streets to their destination! Such is an offence to decency, sanitation, and common sense. In the large abattoirs on the Continent, skins, hoofs, hides, etc., are all treated in the buildings on the site of the public abattoir and converted into leather, glue and other articles, thus greatly adding to the revenue.

In the Edinburgh abattoir, the sale of blood, manure, hoofs, etc., produces over 1,000*l.* per annum.

In the Paris abattoirs each inspector is a fully qualified man, and the position is an honourable one, only obtained after stringent examination.

Every animal is carefully inspected by a veterinary inspector on entering the abattoir, again examined directly after being slaughtered, and finally the carcase is inspected before leaving the abattoir, and, if the flesh is found to be perfectly sound, it is marked with an official stamp. Such drastic, but entirely necessary inspection, can only be exercised in a public abattoir where the work of slaughtering is centralised.

Another enormous advantage to the butcher is that the public abattoirs are fitted with labour-saving appliances, which the private individual, killing in a small slaughter-house, would be unable to provide, thus reducing the cost of labour to a minimum.

CHAPTER IV.

OPPOSITION TO PUBLIC SLAUGHTER-HOUSES.

THE opposition to public slaughter-houses in England by those monetarily interested in either raising or dealing in cattle, and also those killing them and selling the meat, is very powerful and of long standing.

To a lesser degree the opposition is frequently offered by a small number of persons who believe that the erection of a public abattoir must necessarily entail a loss of revenue and therefore increase the amount of their (already high) rates.

Quite irrespective of the humanitarian and hygienic point of view, it may be interesting to consider the matter from a purely commercial standpoint.

There are probably no traders more conservative than those dealing with our meat supply, and the old statement that "what was good enough for our fathers is good enough for us," is supposed to conclusively settle any argument. It is, however, doubtful if our ancestors living only fifty years ago quite realised that the value of imported meat food, then valued at 9½ million pounds sterling, would in 1906 reach the prodigious total of over 52 million pounds.

By the courtesy of the Board of Trade, I am enabled to append a comparative table showing the value of imported meat, etc., at intervals of ten years since 1866.

The latest Board of Trade returns show that for the first seven months of 1907 the total value of cattle for food and meat imported, reaches the sum of 35,808,000*l.*

These enormous imports naturally seriously affect the position of the British farmer and cattle breeder. Freight from foreign countries and the Colonies is very inexpensive, and therefore foreign meat can be sold at a cheaper rate than that produced from cattle grown in the United Kingdom, especially as in the slaughter-houses at the stage of embarkation there is practically no system of inspection, and in the case of imported meat there is absolutely none of any value in detecting tuberculosis.

To a large extent this fact accounts for the great opposition of butchers to public abattoirs. In these buildings on the Continent every animal and carcase is examined three times by fully qualified inspectors, and finally officially stamped

UNITED KINGDOM.—IMPORTS OF MEAT, ETC.

C. 5854.

Statement showing a Total Declared Value of Meat (including live animals for food) imported into the United Kingdom during each of the undermentioned years, distinguishing the several descriptions of meat, etc. imported. (Extracted from the "Annual Statements of the Trade of the United Kingdom" for the respective years in question.)

Description of Meat, etc.	1866.	1876.	1886.	1896.	1906.
Live animals for food:—	£	£	£	£	£
Oxen and bulls	3,605,411	3,554,480	4,358,868	9,241,455	9,688,946
Cows	341,793	1,097,019	571,041	62,331	41,797
Calves	145,737	208,941	138,937	1,369	1,437
Sheep and lambs	1,504,312	2,226,952	2,010,194	1,133,634	156,947
Swine	242,606	172,727	63,357	10	..
Meat:—					
Bacon	1,699,301	7,558,753	6,159,184	7,854,515	14,644,115
Hams	169,287	1,052,576	2,243,644	3,136,089	3,491,594
Beef (fresh)	162,073	467,560	1,862,284	5,028,828	9,785,607
„ (salted)	401,844	476,020	316,393	303,700	217,947
Mutton (fresh)	..	..	1,405,383	4,718,546	7,645,935
Pork (fresh)	87,555	71,442	200,293	687,241	1,130,950
„ (salted)	482,630	739,297	431,245	291,966	266,800
Unenumerated (fresh or salted)		281,830	111,468	554,064	1,145,464
Preserved (other than salted)					
„ „ Beef	432,441			1,053,954	1,103,695
„ „ Mutton		887,035	1,169,777	261,842	125,954
„ „ Other sorts				519,711	593,022
Poultry			351,888	705,478	869,114
Game	174,971	297,018	..	..	116,343
Rabbits			287,816	401,614	1,000,786
Total	9,459,961	19,091,650	21,681,772	35,896,347	52,026,453

BOARD OF TRADE,
October 7, 1907.

before leaving, but here no such system obtains. The English butcher frequently exhibits his wares indiscriminately and describes them as "English meat" or "home killed," which to the general purchaser conveys the same meaning. Certainly the "home killed" cattle are slaughtered here, but it is absurd to pretend that a few days confinement in English lairs before killing renders the meat "English." The retail butcher therefore sells enormous quantities of foreign meat without the purchaser being able to distinguish between it and that raised in England. * Were the public abattoir system established, it would be perfectly

* Since writing the above I have had occasion to visit an important seaside resort, and happened to notice the shop of one of the largest purveyors of meat in the town. The entrance of the shop was in the centre, and on either side joints were exposed for sale. One side was presumably devoted entirely

easy to stamp the carcases as on the Continent, and certainly all imported meat should have a distinctive mark. This would doubtlessly somewhat diminish the profits of the unscrupulous retailer, selling foreign meat as English, and it would most certainly tend to encourage the production of home-grown meat, to the advantage of the British farmer and cattle-dealer.

Another argument brought forward by the butchers is that the cost of carting meat from the public slaughter-houses to their shops would be a very serious item. But when it is considered that of the 5000 butchers in London, only about 318 of them possess private slaughter-houses, it is obvious that the vast majority have to cart their meat from the private slaughter-houses, where the animals are killed, exactly as they would from the public abattoir, and exactly as they now have to cart the 52,000,000*l.* worth of imported meat from Deptford or the various docks.

It is also contended that carting the meat causes a loss of "bloom." Thus 4,700 out of the 5,000 London butchers must suffer this loss at the present time. As another example I find that the abattoir at St.-Anne's-on-sea is not financially successful owing to the fact that most of the butchers purchase the meat from the wholesale markets at Manchester or Liverpool. As St. Anne's is about 40 miles from Manchester and about the same distance from Liverpool, the loss of "bloom" cannot seriously be considered by the butchers to be a matter of great importance.

That the complaints relative to the cost of carting, and deterioration of meat caused by travelling are exaggerated, may be gathered from the fact that in the evidence of two witnesses before the Tuberculosis Commission, one gentleman stated that butchers would almost rather give up killing, than suffer the inconvenience of conveying their meat from the public slaughter-houses to their shops. He however rather favoured them if the abattoir could be arranged in the next street to his shop. On further questions being asked, this witness replied that an abattoir "anywhere within a quarter of a mile would be no objection, and in a city like London half a mile to three-quarters of a mile apart would be satisfactory." Another witness, however, stated that public abattoirs 14 miles apart would be quite practicable, viz.: within a radius of 7 miles. He gave as an illustration a case where 170 cattle were killed and the carcases carted 10 miles without deterioration.

to foreign meat, and each joint was frankly labelled "Australian," "American," "Canadian," etc., whilst the other side was obviously presumed to be devoted to English meat. A large number of joints were exposed for sale (about fifty or sixty pieces) and were labelled "home killed," and interspersed between them were three joints only, labelled with the name of the English breeder and the farm on which the animals were "fatted." Undoubtedly to the ordinary purchaser, the impression would be conveyed, that the whole of the meat of this particular side of the shop was English, instead of practically the whole of it being produced from Colonial or foreign cattle, killed in one of the foreign animal wharves after importation.

Another argument brought forward by the butchers is also inconclusive. It is contended that in the public slaughter-house, the method of inspection is so much more rigid and severe, that diseased meat is more frequently condemned than in the private slaughter-house. This is unquestionable, but certainly not a fact that the consumer will be inclined to regret. To the nation this is an enormous advantage, and one which it is difficult to over-estimate.

The arguments usually adduced by the breeders and dealers are principally that, were the public abattoir system established in England, the price of home-grown meat would be increased, that more foreign cattle and frozen meat would be imported from other countries, and the sale of home-grown cattle would decrease.

On January 16 last, at a meeting of the City Corporation, presided over by the Lord Mayor, the following resolution was brought forward by the wardmote of Aldersgate. "That this wardmote regrets to learn that the trade of the Central Meat Markets is gradually getting into the hands of the meat-trust, to the detriment of the consumer, and calls upon the Corporation, as the market authority, to safeguard the interests of the consumers." Discussion ensued, and one member stated his opinion: "it may be, that in a few years there will not be an ounce of British produce in the markets." The matter was referred to the Markets Committee.

A representative of the "Daily Express" who interviewed the Aldersgate members of the Court of Common Council states he found the facts were as follows:—

1. Fifty shops in Smithfield Market are already controlled by four firms representing the American Meat Trust.

2. 80 per cent. of the meat sold comes from abroad.

The representative was also told by a leading member of the Smithfield Club that "the American companies do not trade under their own names, but buy up old established businesses and carry them on under the old names; so the Corporation is practically powerless." Whether this statement is merely the opinion of an individual member of the Club or whether the members of the Club have generally during the last ten years awakened to the fact that the enormous sale of foreign meat is injuring not only their own trade but that of the farmer, I am unable to say. But in the "Times," December 7, 1898, I find that the following resolution was carried at a Council meeting, submitted to the general meeting, and unanimously adopted:—

"That this Club, having become aware of the proposal of the London County Council to take steps with a view to the abolishing of private slaughter-houses in London and the substitution of public slaughter-houses or abattoirs, is of

the opinion that the proposals are unnecessary and inexpedient, and that the adoption of them would be most injurious to the interests of this Club and of all those engaged in British agriculture." If it is a fact that to-day only 20 per cent. of home-grown meat is now sold in Smithfield market, and that in a few years' time not an ounce of it will be sold there, it is difficult to conceive how the position of the members of the Club and the *British* agriculturalists could have well been more seriously injured by the establishment of public abattoirs.

As with other articles, superior goods naturally are sold at a higher price than inferior ones, and the establishment of the abattoir system would tend to increase rather than decrease the raising of cattle, and diminish the imports of foreign cattle and meat.

Many witnesses before the Tuberculosis Commission complained that, whilst in some abattoirs the work of inspection and condemnation was carried out fairly and reasonably, in others whole carcases were condemned which showed the slightest degree of disease in any part. Undoubtedly, in fairness to the butchers, the powers exercised by the veterinary inspectors should be uniform throughout the Kingdom. In 1904 the Local Government Board issued a circular to the Councils of Metropolitan and other Boroughs, detailing the minimum amount of disease which should necessitate the entire, or partial, condemnation of the carcase. (Appendix A.)

The Board also suggested that if a butcher who is in possession of tuberculous meat has notified the fact to the proper authorities as soon as he could be reasonably expected to be aware of it, the case should not be taken into court.

CHAPTER V.

COMPENSATION FOR COMPULSORY CLOSING OF PRIVATE SLAUGHTER-HOUSES, AND COMPENSATION FOR CONDEMNED MEAT.

THE question as to whether, after a public slaughter-house is built, the butchers who own one or more private slaughter-houses should be compensated for compulsory closing, is an important one. This matter was most carefully considered by the Tuberculosis Commission, and the following recommendation occurs in the report: "When the local authorities in any town or urban district in England and Wales and Ireland have provided a public slaughter-house, power be conferred on them to declare that no other place within the town or borough shall be used for slaughtering, except that a period of three years be allowed to the owners of existing registered private slaughter-houses to apply their premises to other purposes. The term of three years to date in those places where adequate public slaughter-houses already exist from the public announcement by the local authority, that the use of such public slaughter-houses is obligatory, or, in those places where public slaughter-houses have not been erected, from the announcement of the local authority that tenders for their erection have been accepted." Such an arrangement, however, would be bitterly opposed by the butchers, and it seems reasonable that they should be compensated, either monetarily or otherwise, for compulsory closing, where the owner has for any lengthy period derived profit from not only killing his own cattle, but those of his neighbours.

Presuming a monetary payment should be made, the amount of compensation would naturally depend on circumstances in each case, and should not be a difficult matter to adjust.

Doubtlessly, as generally happens, the buyer and seller would have different views as to the value of the property. Herr Hugo Heiss, in his interesting book on "Our Slaughter-house System" (written in collaboration with Mr. C. Cash), states that, when the closing of the private slaughter-houses was made compulsory in Germany, in many cases no amicable settlement could be made, and Government arbitrators were appointed to settle the amounts to be paid. From twenty-three towns claims to the extent of 85,200*l.* were made, and eventually the sum of 11,360*l.* only was paid, viz., an average of about 493*l.* per town, or 13 per cent.

of the amount claimed. Herr Heiss adds: "In many towns no compensation was demanded, because the butchers were intelligent enough to hail the establishment of an abattoir as a welcome improvement which would further their own interests."

A similar and laudable example occurred at Llandudno, when, on the erection of the public abattoir in 1900, the whole of the butchers, recognising the many advantages, voluntarily closed their private slaughter-houses without asking for compensation.

Perhaps the most satisfactory method, and one in which no large initial outlay is necessary, is that of giving to owners of private slaughter-houses exceptionally low terms for killing in the public slaughter-house, or even for a stated period, to allow them to do so almost free of cost. The former system was adopted when the Glasgow abattoirs were erected about 55 years ago, and found to be perfectly successful.

Of course, such concessions would be only given to the owner during his lifetime.

Compensation for Condemned Meat.

A large amount of evidence was taken before the Tuberculosis Commission regarding the question as to whether compensation should be paid to the butchers for meat condemned as unfit for food. It is generally acknowledged that, owing to the difficulty (almost amounting to an impossibility) for even an expert butcher to detect tuberculosis in cattle, when purchasing in the open market, many honest tradesmen suffer loss through buying animals, which on being killed are proved to be wholly, or partly, unfit for food. Yet on the other hand, it is not uncommon for unscrupulous breeders to sell, and equally unscrupulous butchers to buy cattle known to be diseased, hoping they may be killed and the meat sold for consumption, without the fact being detected. This would be impossible under the abattoir system. On this question four of the seven commissioners were unable to recommend granting compensation under any circumstances, and reported as follows:—

"We know of no ground on which a purchaser who, having bought at a risk with a view of placing the article purchased on sale, should receive the whole profit of his transaction if he has escaped loss, but should demand compensation from the public if his transaction has not been fortunate."

The other three commissioners, however (although in accord with their colleagues on every other point in the report), added a memorandum, recommending that compensation should be paid to the owner provided (*a*) the animal was apparently well nourished and healthy before slaughter; (*b*) that the owner had paid no less than a minimum price for the animal, to be fixed from time to time by the Board of Agriculture; (*c*) that compensation should not be paid above a maximum sum, also to be fixed by the Board of Agriculture; and (*d*) that the

compensation should be paid by the council of the administrative county, which should be entitled to repayment of one-half of the amount from imperial funds.

Prima facie, the butchers have a strong case when asking for compensation, and are more or less indifferent as to whether such compensation should be paid out of imperial or local funds. Probably, the above suggestion that each should bear one-half of the burden is the most equitable solution if compensation is to be paid at all.

It has been pointed out that some difficulty may arise as to which local authority would be liable for payment. Supposing a tuberculous animal were bred in (say) Leicester and killed in (say) Bedford, which authority should bear the expense? I think, however, that this is a matter which could be easily arranged, and if the general principle were agreed to, the details could be adjusted.

A large amount of evidence was taken before the Commission in reference to mutual insurance, and it was found that the cost generally varied from a few pence to about a shilling per beast slaughtered, but many butchers thought the risk involved was not worth this trifling expenditure. The commissioners state that "We believe that all losses by reason of seizure owing to tuberculosis of the carcases of animals for which a reasonable price has been paid can be best and easily met by the system of mutual insurance, and with a view of promoting the use of public slaughter-houses. We are further of opinion that there would be advantage in districts where such establishments have been provided and are supervised by local authorities, in those bodies being empowered to contribute to the insurance funds."

The amount paid in premiums for such insurance would be very small and would gradually become less as the farmers used modern methods for the prevention of tuberculosis in their cattle, which, thanks to recent scientific research, is now quite practicable.

In England we have nothing to correspond with the excellent Frie-bank of the German abattoir, where perfectly wholesome (although not first-class) meat is sold to the poorer inhabitants. When a portion of a carcase is found on slaughtering, to be slightly affected by disease, but not sufficiently to render it unfit for food, it is either sterilised and sold as cooked meat, or, if only very slightly affected, the meat may be purchased in the raw state. In order to prevent indiscriminate sale, no butcher, meat salesman, or restaurant keeper is allowed to purchase at the Frie-bank, and no individual can buy a larger quantity than 10 lb. The charge is about one-half of that for first-class meat, and the demand is usually in excess of the supply. In England, unfortunately, we have no such distinction between the best and the inferior qualities of meat, and as at the Frie-bank the whole of it is subject to rigid inspection, the food, although cheap, is as wholesome as that for which a much larger price has been paid.

CHAPTER VI.

PUBLIC SLAUGHTER-HOUSES—PROFITABLE, SELF-SUPPORTING, OR CONDUCTED AT A LOSS.

THE question as to whether public slaughter-houses in England can be made self-supporting or yield a profit, without necessitating a subsidy from the rates, has for years past been a fertile source of discussion. They are almost invariably financially successful on the Continent, and can be, and should be made so, here.

Undoubtedly in the near future Legislative measures will be passed enabling the local authorities to close private slaughter-houses when a public abattoir is erected in the district. Then, doubtlessly, many of such institutions at present existing will show a profit instead of a loss. But, irrespective of this, public slaughter-houses are almost as necessary to the community as hospitals, sanatoria, public baths, sewage schemes, public libraries, cheap locomotion, etc. The most pessimistic opponent to the public slaughter-house system cannot contend that the above mentioned institutions yield a profit on the capital expended. They are needful for the bodily or mental requirements of the people, and are supported by an addition to the rates, or by gifts or endowments of private individuals. But public abattoirs, planned on sound lines and humanitarian and hygienic principles, if well managed, need no such subsidy.

The following tables are appended to illustrate this point. Table A shows the population of 37 towns and cities, with the receipts, expenditure, interest on capital and sinking fund, and loss or profit on each undertaking for the year 1906–7, or in a very few cases where later statistics are not available, for the year 1905–6. This table refers to public slaughter-houses where markets are attached, and the accounts are based on the combined undertakings.

Table B shows similar details to those in Table A in 96 towns or cities, but where the accounts of any markets that may be worked in connection with the abattoirs, are kept separate and distinct.

It will be seen from Table A, that of the 37 public slaughter-houses in that list, 25 are profitable, viz., 68 per cent., and also from Table "B" that of the 96 public slaughter-houses there enumerated 30 are profitable or self-supporting, viz., 31 per cent.

Public Slaughter-Houses with Markets (Combined undertakings).

TABLE A.

—	Population.	Receipts.	Expenditure.	Interest on Capital and Sinking Fund.	Total.	Loss.	Profit.
		£	£	£	£	£	£
Aberystwith	8,013	336	259	102	361	25	..
Barnstaple	14,137	1,303	1,375	425	1,800	497	..
Bideford	8,754	42	34	59	93	51	..
Birmingham	522,182	38,791	16,687	18,635	35,322	..	3469
Bolton	168,205	12,732	6,387	4,244	10,631	..	2101
Bradford	279,809	32,822	20,213	10,732	30,945	..	1877
Cardigan	3,510	190	30	..	30	..	160
Cardiff	164,420	7,796	4,307	4,178	8,485	689	..
Carmarthen	9,935	1,628	658	440	1,098	..	530
Clevedon	5,898	135	162	22	184	49	..
Derby	105,785	8,177	3,864	1,086	4,950	..	3227
Doncaster	28,924	3,740	2,031	344	2,375	..	1365
Fleetwood	12,093	747	295	691	986	239	..
Glasgow	760,468	32,682	29,659	9,653	39,312	6630	..
Hanley	61,524	4,149	2,649	1,031	3,680	..	469
Halifax	104,933	10,817	4,425	5,800	10,225	..	592
Haverfordwest	6,007	738	500	228	728	..	10
Huddersfield	95,008	9,066	4,400	4,674	9,074	8	..
Leeds	428,923	29,956	11,426	18,151	29,577	..	379
Leicester	211,574	17,997	9,394	4,209	13,603	..	4394
Llanelly	25,617	3,871	1,804	663	2,467	..	1404
Manchester	543,969	76,707	50,328	21,311	71,639	..	5068
Melton Mowbray	7,454	859	654	..	..	..	205
Neath	13,732	2,454	300	720	1,020	..	1434
Newton Abbot	12,518	1,428	910	970	1,880	452	..
Northampton	87,021	4,395	2,262	..	2,262	..	2133
Plymouth	107,509	7,491	3,653	2,523	6,176	..	1315
Preston	112,982	2,099	1,803	243	2,046	..	53
Rotherham	54,348	2,799	1,251	1,390	2,641	..	158
Salford	220,560	6,847	4,685	2,835	7,520	673	..
Scunthorpe	6,979	650	213	361	574	..	76
Sheffield	380,717	31,915	9,852	22,247	32,099	184	..
Swansea	94,514	8,622	3,469	2,615	6,084	..	2538
Tenby	4,400	379	165	91	256	..	123
Wakefield	41,544	3,773	1,149	3,414	4,563	790	..
Wolverhampton	94,179	9,299	2,607	2,612	5,219	..	4080
Workington	26,141	287	229	..	229	..	58

Thus out of the 133 public slaughter-houses mentioned in Tables A and B (including I believe an almost complete list of those at present existing in England), 55 are profitable, viz., 41 per cent. of the whole number. This fact is distinctly encouraging, when it is considered that so many private slaughter-houses exist to compete with the public ones, and also that many are so ancient as to be practically useless, whilst others have been erected so recently that the loss shown in working last year, will shortly become a profit.

Public Slaughter-Houses.

TABLE B.

——	Population.	Receipts.	Expenditure.	Interest on Capital and Sinking Fund.	Total.	Loss.	Profit.
		£	£	£	£	£	£
Abergavenny . .	7,795	145	81	60	141	..	4
Accrington . .	43,059	391	318	479	797	406	..
Alnwick . . .	6,716	54	33	..	33	..	21
Altrincham . .	17,744	295	179	267	446	151	..
Annan . . .	5,805	80	106	54	160	80	..
Arbroath . . .	22,546	495	383	410	793	298	..
Ardrossan . .	6,045	87	69	..	69	..	18
Ayr . . .	10,177	550	308	..	308	..	242
Barrow-in-Furness .	57,584	650	461	688	1149	499	..
Barry . . .	27,028	375	425	344	769	394	..
Belfast . . .	348,000	2196	1427	136	1563	..	633
Birkenhead . .	110,928	479	531	459	990	511	..
Blackburn . .	127,527	928	759	555	1314	586	..
Blackpool . .	47,346	508	542	700	1242	734	..
Brighton . . .	123,478	505	1053	717	1770	1265	..
Burnley . . .	97,044	1015	625	554	1179	164	..
Burntisland . .	4,726	37	86	22	108	71	..
Bury . . .	58,028	1772	3145	557	3702	1930	..
Buxton . . .	10,181	12	..	Capital repaid	12	..	12
Carlisle . . .	45,478	669	697	462	1159	490	..
Carnarvon . .	9,760	244	143	105	248	4	..
Cheltenham . .	49,439	139	194	130	324	185	..
Chesterfield . .	27,185	54	21	..	21	..	33
Chorley . . .	26,850	259	256	138	394	135	..
Cleckheaton . .	12,523	44	49	..	49	5	..
Coatbridge . .	1,035	716	366	117	483	..	233
Colne . . .	23,000	21	64	173	237	216	..
Croydon . . .	151,000	305	305	130	435	130	..
Cullen . . .	1,936	32	21	34	55	23	..
Dartmouth . .	6,579	59	19	111	130	71	..
Daventry . .	3,780	6	6	..	6	..	Self-supporting
Denny and Dunipace .	..	110	72	87	159	49	..
Douglas, Isle of Man .	22,500	306	241	246	487	181	..
Dublin . . .	292,000	2258	2259	1121	3380	1122	..
Dundee . . .	160,878	4397	2283	1704	3987	..	410
Dunfermline . .	25,250	470	479	99	578	108	..
Ebbw Vale . .	20,993	3	24	..	24	21	..
Edinburgh . .	316,523	5478	4462	Capital repaid	4462	..	1016
Elgin . . .	8,260	182	135	195	330	148	..
Exeter . . .	46,940	241	231	158	389	148	..
Forfar . . .	12,117	266	191	..	191	..	75
Forres . . .	4,313	137	83	105	188	51	..
Fraserburgh . .	8,998	172	93	78	171	..	1
Goole . . .	16,576	173	162	..	162	..	11
Greenock . .	67,626	1038	975	465	1440	402	..
Great Harwood. .	12,015	54	89	..	89	35	..
Hereford . . .	21,382	214	158	Capital repaid	158	..	56

PUBLIC SLAUGHTER-HOUSES. TABLE B.—*continued.*

——	Population.	Receipts.	Expenditure.	Interest of Capital on Sinking Fund.	Total.	Loss.	Profit.
		£	£	£	£	£	£
Hexham	7,071	123	70	140	210	87	..
Ilfracombe	8,557	20	2	49	51	31	..
Ilkley	7,755	123	120	110	230	107	..
Inverness	21,249	426	319	..	319	..	107
Kelso	4,525	193	226	84	310	117	..
Kendal	14,183	128	217	9	226	98	..
Kilmarnock	33,142	570	445	139	584	14	..
Kirkcaldy	34,063	329	317	..	317	..	12
Kircudbright	2,386	31	26	..	26	..	5
Lanark	6,440	155	155	43	198	43	..
Lancaster	40,329	387	207	264	471	84	..
Leith	76,667	393	435	223	658	265	..
Leominster	5,826	3	2	..	2	..	1
Lincoln	47,072	406	646	371	1017	611	..
Llandudno	9,307	259	275	346	621	362	..
Linlithgow	3,987	116	17	77	94	..	22
Lytham	7,185	57	36	..	36	..	21
Market Harborough	7,735	20	23	46	69	49	..
Maryport	11,896	126	93	56	149	23	..
Middlesbrough	91,317	92	159	..	159	67	..
Monmouth	5,095	56	23	..	23	..	33
Morpeth	6,158	67	32	..	32	..	35
Newport, Mon.	3,241	554	474	Capital repaid	474	..	80
Oswaldtwistle	14,192	50	81	69	150	100	..
Paisley	79,315	1393	1032	464	1496	103	..
Peebles	3,095	120	52	98	150	30	..
Perth	33,566	560	536	83	619	59	..
Pontypridd	32,319	436	407	706	1113	677	..
Port Glasgow	16,871	63	90	..	90	27	..
Pwllheli	3,675	82	74	44	118	36	..
Reading	72,214	266	595	..	595	329	..
Rothesay	9,325	144	144	..	..	..	Self-supporting
Rugby	16,830	144	58	240	298	154	..
St. Andrews	7,621	120	104	77	181	61	..
St. Anne's-on-Sea	6,807	83	139	137	276	193	..
St. Helen's, Lancs.	84,410	615	664	454	1118	503	.
Shipley (York)	25,270	349	288	202	490	141	..
Slaithwaite	4,763	25	15	..	15	..	10
Southport.	48,087	237	294	243	537	300	..
South Shields	97,267	270	493	580	1073	803	..
Tain	2,076	64	34	..	34	..	30
Tenby	4,400	60	49	..	49	..	11
Troon	3,310	91	77	30	107	16	..
West Hartlepool	62,614	645	571	439	1010	365	..
Weston-super-Mare	19,047	286	249	Capital repaid	249	..	37
Whitley Bay and Monkseaton	7,705	115	158	..	158	43	..
Worcester	46,623	115	158	..	158	43	..
Workington	26,143	157	105	Capital repaid	105	..	52
Wrexham.	14,966	111	118	Capital repaid	118	7	..

I am indebted to Mr. Robert Donald, the Editor of the "Municipal Year Book," for kindly allowing me to make extracts from this most useful publication in compiling the above tables.

In the following table (C), is a list of 21 English public slaughter-houses, with the approximate number of animals slaughtered per annum, and also the number of private slaughter-houses existing in each town. It will be noted that in these 21 towns or cities, 520 private slaughter-houses are still in existence, viz., an average of over 24 per town.

PUBLIC SLAUGHTER-HOUSES.

TABLE C, showing the average number of animals killed per annum in the public slaughter-houses of several towns and cities, and also the number of private slaughter-houses at present existing.

—	Approximate Number of Animals Slaughtered per annum.	Number of Private Slaughter-houses in Town or City
Birmingham	212,844	131
Bolton	Very little used	34
Derby	No record	50
Huddersfield	27,603	15
Leicester	29,900	78
Manchester	212,879	90
Birkenhead	18,775	1
Blackpool	43,000	3
Brighton	26,875	33
Carlisle	12,318	2
Cheltenham	6,500	18
Clitheroe	3,620	6
Colne	860	11
Dartmouth	4,000	2
Kendal	8,450	1
Lincoln	13,620	18
Market Harborough	Recently erected	9
Rugby	No record	8
St. Helen's	1,500	8
West Hartlepool	24,170	1
Whitley Bay	Recently erected	1

CHAPTER VII.

SELECTION OF SITE; BUILDINGS, ETC.; AND METHODS OF KILLING ANIMALS.

THE position selected for a public abattoir must naturally depend not only on the population of the district to be served, but also on its geographical situation. It is essential that the site should be in close proximity to a railway, in order that one or more sidings may be obtained for bringing animals to the abattoir, to facilitate the work of sending away the meat, offal, manure, etc., and also to avoid the necessity of carting or driving animals through the streets. Preferably, the site should be on the outskirts of the town, although the work of slaughtering, if properly carried out, should not be a nuisance to the neighbours. On the Continent it is found that the establishment of a public abattoir actually increases the value of the surrounding property, as shops and residences are erected in the immediate vicinity, to meet the needs of those employed in the buildings.

An ideal position for an abattoir in a large city is that of La Villette, Paris. The site is situated in the north-west part of the city, just within the fortifications, and covers an area of about two-thirds of a mile long, by one-third of a mile broad. It is exceedingly well served by the railway which skirts the whole of the Eastern side of the site, whilst the cattle market is divided from the abattoir buildings by the Canal de l'Ourcq. The Western side is bounded by the Canal du Depotoir and Canal St. Denis, and at the junction of these three canals is an enormous basin covering an area of about three acres. Unique facilities are therefore provided for the carriage of live animals, meat, manure, etc., both by rail and water. It is, of course, impossible to secure such exceptional advantages for every abattoir erected in England, but undoubtedly the site selected should be near the railway.

A very general fault in the English abattoirs is the extremely limited area allowed for the buildings. In many cases the site is chosen in a district when the land is extremely valuable and often surrounded by residential property; this necessitates cramping the buildings and placing the lairs on an upper floor, approached by sloping ways, a most objectionable arrangement, but unfortunately necessary on a limited site. Too much stress can hardly be laid on the fact that ample space should be provided for circulation and also for the probability of future extension of the buildings.

As an example, whilst at the abattoir of Vaugirard 173 yards super are allowed for each 1000 inhabitants, at Birmingham the site only provides 23 yards super.

BUILDINGS, ETC.

There is probably no type of buildings in which it is so essential that men, proficient in their particular trades or professions, should collaborate, in order to secure a successful result.

The architect, engineer, veterinary surgeon, and last (but certainly not least), the experienced abattoir superintendent, should work together in one harmonious whole.

The designing of a public abattoir, with the many buildings all used for different purposes, is so complex and technical, that it is practically impossible for any single individual to be quite conversant with every detail.

In England, it is unfortunately usual when an abattoir is to be erected, for the work of designing the buildings to be placed in the hands of a municipal official, quite irrespective of the fact that he may have never previously studied the subject. This gentleman then usually visits a few existing abattoirs (often obsolete and badly planned) and on his return founds his plans on the information thus gathered. Ancient examples are more or less copied, and defective principles and equipment are supposed to be counterbalanced by a lavish (frequently wasteful) use of glazed brickwork. It is as incongruous to erect a badly planned building with fine elevations and poor machinery, as to erect one perfect in engineering and fittings, but totally devoid of any architectural merit.

At present the planning of public abattoirs has been but little studied by English architects and engineers, mainly owing to the fact that the subject is uncongenial, and also that when such buildings are erected the authorities generally entrust the designing to their official, who usually is assisted in a very large degree by a firm of engineering contractors conversant only with their particular portion of the work. The frequent result is that the planning of the buildings is quite subservient to their engineering equipment, a lamentable example of putting the "cart before the horse."

In England the great majority of Public and Municipal buildings, Town Halls, Libraries, Baths, Schools, Institutes, etc. are erected from designs submitted in open, or limited competition. I have little doubt that, if any authority proposing to erect public abattoirs were to invite competitive designs, the response would be large, and if the drawings were judged by a competent assessor, the result would be not only satisfactory to the promoters, but productive of designs possibly

founded on the best Continental principles, or perhaps embracing new and original ideas.

The photographic illustrations in this volume of the Paris abattoirs may serve to show how very successful the French architects have been in investing these perfectly utilitarian buildings with an architectural, and quite distinctive character, whilst at the same time keeping within the limits of reasonable outlay.

It is undeniable that work of a repulsive character, is better executed, and loses much of its repulsion, when carried out under cleanly and sanitary conditions.

Throughout the whole of the buildings connected with an abattoir, timber should be used as little as possible, especially in situations where the surface is liable to be contaminated by blood or refuse.

The number and size of the buildings necessary in a public abattoir, will naturally depend entirely upon the extent of the district to be served, but in the smallest establishment the following will be necessary :

1. Administrative block and superintendent's house.
2. Lairs, slaughter-halls, and cooling rooms for various animals.
3. Cold storage and chill rooms.
4. Lairs and slaughter room for suspected or infected animals.
5. Destructor.
6. Offal store and accomodation for treating offal.
7. Pathological room.
8. Workmen's mess-room, kitchen, baths, lavatories and w.c's.

The planning of the administrative block will be governed by the magnitude of the abattoir, and should contain accommodation for the clerical staff, veterinary inspectors, superintendent, etc.

The superintendent's house should be placed in such a position that a view can be obtained over the whole, or greater part of the site.

The most careful attention should be given to the planning of the lairs, slaughter-halls, and cooling rooms. Abundant light, air, and ventilation are necessary. Extreme cleanliness is essential in these buildings (as in all others in an abattoir), and therefore any material not impervious, should be carefully avoided. In the slaughter-halls and cooling rooms a high, light-coloured glazed brick dado, with very small and smooth joints, is found to be satisfactory, and the upper part of the walls cemented and painted, or faced with salt-glazed bricks.

In a recent publication the writer advocates the use of salt-glazed bricks for the dado in the slaughter-hall, "as the colour being red-brown, splashes of blood are not apparent." It is difficult to imagine how such an arrangement can be

advantageous in buildings where the slightest trace of fouling should be easily detected and speedily cleansed.

It is advisable that the paint, and indeed all other materials, should be quite light in colour for the above reason. Many materials have been tried for the flooring of the slaughter courts in order to avoid the butchers or animals falling during the work of killing. Asphalt, cement, granite setts, stone slabs or corrugated bricks are usually employed, but none of them are sufficiently impervious or afford a good foothold. At present corrugated stone slabs are found to be the most practicable as regards utility and cost of maintenance. An experiment is being tried by the Admiralty at Chatham, with a floor laid in specially designed blue Staffordshire bricks. These have corrugations on the upper surfaces, and in addition a number of small circular projections which afford a foothold for the animals and slaughterers.

In view of the fact that no living animal should see another being killed, or see, or smell blood, the arrangement of the slaughter court in connection with the lairs is a matter of the utmost importance.

In the abattoirs erected nearly half a century ago, each butcher was provided with a separate killing room, divided from that of his neighbour by brick walls, but this arrangement is now nearly obsolete, as it precluded facilities not only for cleanliness, but also for adequate inspection. Such an arrangement was practically a series of private slaughter-houses, with the single advantage that they were concentrated instead of being scattered. This fact has been fully appreciated by the authorities at Edinburgh, where the existing abattoirs were erected on this principle in 1851. Recently a fresh site has been secured, and new buildings are about to be erected on modern lines, for which purpose a deputation has visited some of the most perfect Continental institutions.

It must be a matter of great regret that the new buildings at Islington for the Corporation of the City of London have recently been erected on this obsolete principle. An expenditure of about 32,000*l.* has been made on a comparatively small abattoir, and, unfortunately, a splendid opportunity has been missed, for erecting what might have been ideal buildings in planning, construction and equipment.

Undoubtedly a large killing court, top lighted, and well ventilated (as in the modern Continental abattoir) is an almost perfect arrangement as regards hygiene and the facilities for inspection.

The late Mr. Blashill, in his report to the London County Council, stated: "It appears to me that when slaughtering is done in well lighted halls, the whole arrangements are more systematic and cleanly. In such circumstances there are no means of concealing slovenliness or dirt, and a proper supervision insures that the least possible amount of dirt is produced."

It is found that in England some butchers object to the open hall system, as each sees the class of cattle his trade rivals purchase and kill. From the consumers' point of view this is certainly an advantage, as it naturally tends to prevent the butchers buying ill-nourished and diseased animals, hoping to place the meat on the market without proper inspection.

It has been contended also that many butchers sell carcases to the retailer immediately after killing, in the slaughtering chamber, and that they object to their prices being known by other butchers. This is, however, hardly obviated at Islington by a wall only about 5 feet high with an open wire trellis above.

Another objection is often raised to the "open hall" system, viz. that the slaughterers are not all equally proficient and expeditious in their work. This is undoubtedly true, and it necessarily follows that if a number of cattle are brought into the slaughter hall together they cannot be killed, prepared for the cooling rooms, and the place washed down ready for the next lot of animals, at precisely the same time. This difficulty has, however, been overcome at Chatham by dividing the hall into separate compartments by dwarf brick walls, thus obtaining all the advantages of the open hall as regards lighting, ventilation, cleanliness and supervision, with none of the disadvantages.

These walls are 5 feet high and only carried half way across the slaughter-hall, which is 22 feet wide, thus allowing plenty of room for the Veterinary Inspectors, and for circulation.

In most of the Continental abattoirs the slaughter-hall and cooling-rooms adjoin. This necessitates killing the animals and dressing the carcases, and removing offal and manure through the slaughter-hall.

In many of the English abattoirs a passage is provided between the slaughter-hall and cooling-rooms to facilitate the work of cartage, offal removal, etc., but they are often draughty, and somewhat dangerous to the slaughtermen, who are frequently in a state of perspiration occasioned by their work. These objections are most cleverly avoided at Chatham, where the covered carcase dressing hall is placed between the slaughter-hall and cooling-rooms, so that the whole of the particularly dirty work is executed in this hall, and is not seen by the animals about to be killed.

The cooling and dressing rooms should be in close proximity to the slaughter-halls, and be so arranged that the meat can be carted away without having to pass through any portion of the abattoir buildings.

The size of the cold store and chill rooms will depend on the number of animals to be slaughtered, and also on the time during which the meat is to be kept.

Whenever cold storage is provided (and such is quite as essential in small

as well as in large abattoirs) it should adjoin a chill room where carcases can be hung for a short time in order to eliminate the greater portion of animal heat in the freshly-killed carcases. This arrangement is necessary in order to prevent condensation on the carcases which would occur if they were taken directly into the cold storage. The temperature of the cold store is kept slightly above freezing-point so that none of the meat is actually frozen, and therefore, unlike the imported meat, does not require thawing, nor does it lose any of its palatable or nutritive qualities even if kept for several weeks. The enormous gain to the butchers must be apparent especially in hot or muggy weather. Instead of having to slaughter at frequent intervals, they are enabled to do so whenever convenient, and yet preserve their meat in perfect condition for a considerable time.

Just recently, and as a result of experiments extending over a number of years, a system of sterilising meat, poultry, fish, eggs, etc., has been brought prominently forward. It is one invented by Mr. Isidore Hislaire, of Brussels, and which may, in the future, very materially affect the question of the preservation of food by a process other than that of refrigeration. By this method perishable articles, after being placed in a chamber from which the air has been extracted by a centrifugal pump, are subjected to impregnation by means of pastiles which are vaporised within the air-tight chamber, and allowed to remain for from fifteen to forty-five minutes. In the case of refrigeration it is well known that any perishable article only resists putrefaction so long as it is frozen or chilled, and decomposition commences as soon as the material is exposed to a higher temperature. By the process of sterilisation it is claimed (and very exhaustive experiments tend to prove) that perishable articles so treated retain their freshness, nutritive qualities, colour, taste and smell for from a fortnight to a month, even when exposed to the most varying conditions of atmosphere and temperature. The following extract is taken from a leaflet issued by the patentees and manufacturers.

"A well-known dealer had under his personal observation beef, mutton and pork hung in an ordinary warehouse from three to five weeks after sterilisation, which, when cut up, presented all the appearance of freshly killed meat. The joints, etc., were distributed amongst medical men and private individuals to the number of 30, who all spoke of the excellent qualities of the meat after sterilisation."

"In another test during the hottest months of last summer, with the thermometer at 90° in the shade, a quantity of mackerel, fresh herrings, Iceland plaice and other kinds of fish, were subjected to the process for thirty minutes. They were subsequently placed in the open air, and kept perfectly fresh and good for five days. Both appearance and flavour also remained unimpaired."

The cost of installing such a system is considerably less than that of a refrigerating plant, and the cost of working it is exceedingly small. The company state that one box of pastiles (costing 4*s.*) is sufficient to preserve approximately 2000 lb. of meat.

In every public slaughter-house, separate lairs should be provided for animals suspected of being diseased, and if found to be so, they should be killed in a separate slaughter-chamber, and a destructor provided for dealing with the carcases, or portions of them, which may be proved to be affected.

Some of the English slaughter-houses are built near the town dust-destructor, in order to avoid the initial expense of erecting a special building and machinery. This, however, is a very faulty arrangement, as the dust occasioned by the burning of refuse enters the cooling-rooms and settles on the carcases. The size and number of the destructors are naturally governed by local considerations, and also by the amount of work carried out at the abattoirs. The destructors should be so arranged that, by an almost automatic process, the infected carcase, or portion of the same, can be destroyed and converted into a powder most valuable as manure. The best known and most efficient apparatus for this purpose, and one largely used in Germany, is that of the Podewil system. The process is practically odourless, being carried out in hermetically sealed chambers. The by-products are subsequently treated and used for various purposes.

A pathological room (in proportion to the size of the abattoir) should invariably be provided to enable the veterinary inspectors to examine meat and make research.

The offal house should, whenever practicable, adjoin the departments devoted to the preparation of tripe, pigs' feet, calves' feet, heads, etc. These buildings should be as near the railway siding as possible, so that the manure can be readily conveyed to trucks for deportation.

The work of the slaughtermen is of such a nature that it is impossible for them to prevent themselves and their working clothes becoming soiled. It is, therefore, necessary to provide a liberal supply of baths and lavatories for their use, and also a dressing room, where the men can change the clothes worn in the abattoir, for their ordinary costume. Although the calling of the slaughterman is a perfectly honourable one, it cannot be denied that the familiarity with the sight of blood must inevitably make them less sensitive than men engaged in other vocations. In most of the Continental abattoirs the men are forbidden, under penalty of heavy fines, to leave the abattoir during working hours. Buffet and restaurants are provided on the site, but I have seen slaughtermen cross over a busy thoroughfare to their favourite café with signs of their trade so apparent as to make the ordinary pedestrian shudder. For this reason a dining-room, kitchen

and bar, where food and refreshments are sold at low prices, should be provided whenever possible, and the men strictly forbidden to leave the slaughter-house, except when dressed in their ordinary clothes.

Methods of Killing Animals.

I do not propose to deal exhaustively with the methods of killing the various animals, as many with greater knowledge of the subject have written on this matter.

But, not only from a humanitarian point of view, but also in the interests of the butchers, it is essential that every animal should be rendered insensible, before slaughter.

This fact to a great extent governs the planning of the slaughter-courts.

In many Continental countries, stunning of every animal is, very rightly, made compulsory, and the butchers are liable to a heavy penalty if this is neglected.

Many witnesses were examined before the Admiralty Commission on this subject, and the merit and demerit of the various appliances, from the poleaxe to shooting apparatus, fully considered.

As a result, the Commissioners recommended: "All animals, without exception, should be stunned or otherwise rendered unconscious before blood is drawn. This is actually the law in Denmark, many parts of Germany and Switzerland, and therefore cannot be considered an impracticable condition. It has the great merit of comprehensiveness and simplicity, and, if carried out, makes the subsequent operations of slaughter of comparative unimportance from the standpoint of humanity."

In England, beasts are rendered insensible before blood is drawn, more to facilitate the work of the butcher than from humanitarian motives. Sheep and pigs are seldom so treated. Undoubtedly it should be made illegal to slaughter any of these animals, unless previously stunned or shot as the case may be. In Paris, beasts are pole-axed and pigs stunned by a heavy mallet.

No notes on this subject would be complete without a brief reference to the Jewish method of slaughter. The Jewish rites forbid rendering any animal insensible before killing, either by stunning or even administering an anæsthetic. It is with reluctance that one has to criticise a method of slaughter allied to a religious observance, but it cannot be denied that the system is barbarous and should be prohibited.

The Admiralty Commissioners heard the evidence of the Chief Rabbi, the President of the Shechita Board, and studied the treatise prepared by Dr. Demlo

in defence of the Jewish system. After most careful consideration, and after receiving the report of such eminent physiologists as Sir Michael Foster and Professor Starling, they came to the conclusion that "The Jewish method fails in the ordinary requirements of rapidity, freedom from unnecessary pain, and instantaneous loss of sensibility." "That the preliminary operations of casting and forcing the animal's head into position for the cut, are difficult, painful, and objectionable from a humanitarian point of view." "That, until some method is devised, and applied, for rendering the animals unconscious previous to the 'casting' and throat-cutting operations, the Jewish system of slaughtering cattle should not be permitted in any establishment under Government control."

Quite recently some interesting experiments were tried at Nantes for killing animals by electrocution. The following note from "The Standard" (February 22, 1908) leads one to surmise whether such a system, possibly modified, could not be employed in connection with the Jewish rites.*

"Professor Leduc, of Nantes, concerning whom an interesting article appeared in 'The Standard' a few days ago, gave a public exhibition of his method for electrocuting animals described in that article, at the public slaughter-house of Nantes yesterday. It will be remembered that Professor Leduc employs a low-tension current, which is alternated about a hundred times a second, which he applies to the head and back of the animals. One of the Professor's greatest hopes concerning the discovery is that it may be of use in a slaughter-house; and with this in his mind he attempted to demonstrate that the method is more humane, quite as thorough, and almost as practicable as any method employed.

"On the first two points it may be said at once that Professor Leduc gained his case. A horse weighing nearly eight hundredweights was killed almost instantly—at all events, in less time than could be calculated—by a current of 110 volts and 60 milliamperes. An ox, weighing two or three stone less, was killed quite as suddenly, with a current of 160 volts and 110 milliamperes, and a young calf with a current of 20 volts. The demonstrations were made before a number of butchers and cattle dealers, who followed them closely, and discussed them intelligently. From the discussion, however, it appears that Professor Leduc will have some difficulty in persuading that he has established his third point—that his method is as practicable as the existing ones."

That every animal should be rendered insensible before blood is drawn cannot be denied. It is a necessity not only from a humanitarian point of view, but it renders the slaughtermen's work much easier.

* Since writing the above I have received a most interesting letter from Dr. H. Adler, the Chief Rabbi, in which he tells me that the killing of animals by electrocution would not be in accordance with the Jewish law.

But, however perfect an abattoir may be in plan and equipment, it is absolutely necessary that the slaughterers should be men trained to perform their work with unerring accuracy, and only allowed to occupy that position after they have proved their fitness by examination. Every slaughterman should be subjected to such a test; if found efficient he should be licensed, and none but licensed men employed in an abattoir.

The necessary facility can be acquired by practice on a wooden model.

As this volume deals more particularly with the necessity to establish, and the planning of public abattoirs, rather than with the actual methods employed in killing the animals, the reader is referred on this subject to the many books published on the methods of slaughtering, and apparatus in use, here and on the Continent.

CHAPTER VIII.

PUBLIC SLAUGHTER-HOUSES.

In the following chapters illustrations and descriptions are given of a number of public abattoirs which at present exist both at home and on the Continent. In view of the fact that many of the splendid German abattoirs have been fully illustrated and described in other works on the subject, I have omitted to include any of them in this volume.

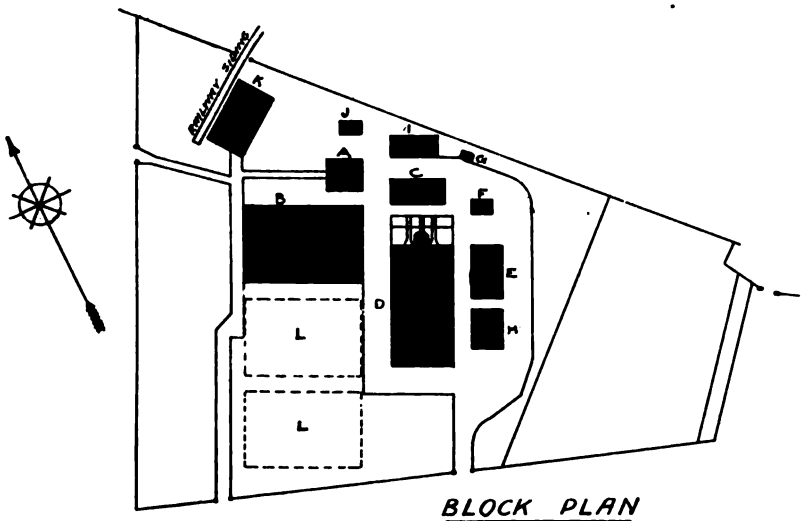
It is somewhat difficult to arrange the buildings chronologically, as many of them have been added to, or altered, since they were erected, and it is equally difficult to arrange them in order of merit, as many have good points in some portion of the planning, which are counterbalanced by defective arrangements in other parts. As will be seen, many (especially the more modern buildings) are on the "open hall" system, whilst almost without exception the older buildings are planned on the "separate system."

Whilst I believe all of the plans illustrated are interesting either as a whole or in parts, some of them are inserted more as "types" than as illustrations of slaughter-houses complying with modern conditions or as schemes to be taken as models for new buildings of the kind.

Abattoirs at H.M. Dockyard, Chatham.

This abattoir was erected by the Admiralty in 1904, and embraces the whole of the points recommended in the report of the Commission appointed to consider the "Humane slaughtering of animals." From a humanitarian, hygienic and practical point of view, with rapidity and economy of working, the planning of these buildings approaches perfection. Although the installation is comparatively a small one, the principle could be extended indefinitely to larger buildings.

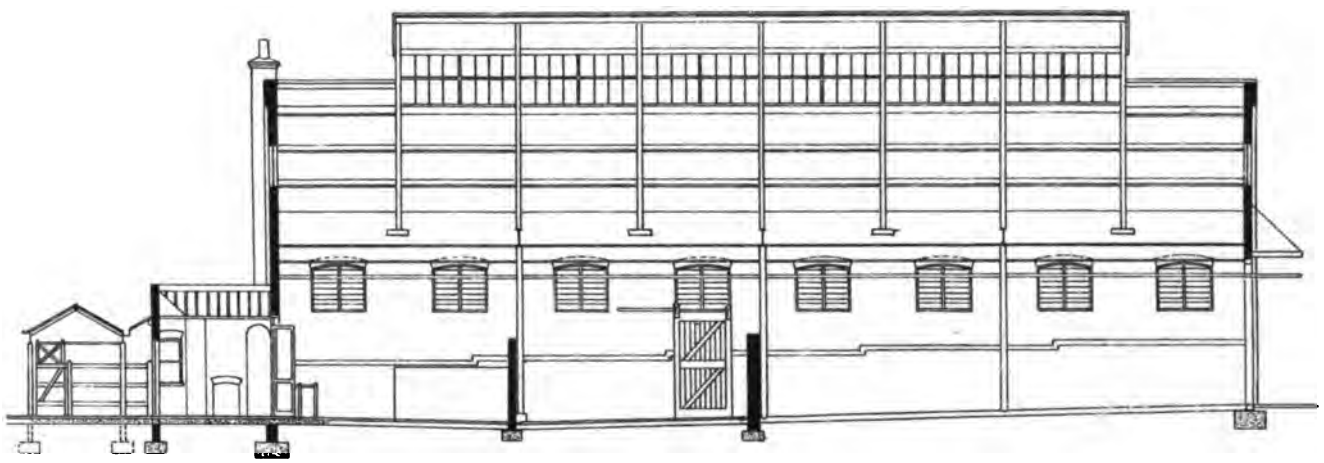
An extract from the report is herewith appended, and it will be seen from the drawings (Figs. 1 and 2) how by judicious planning the whole of the recommendations have been carried into effect, without the slightest waste of floor space, or undue extravagance in the cost of the buildings.



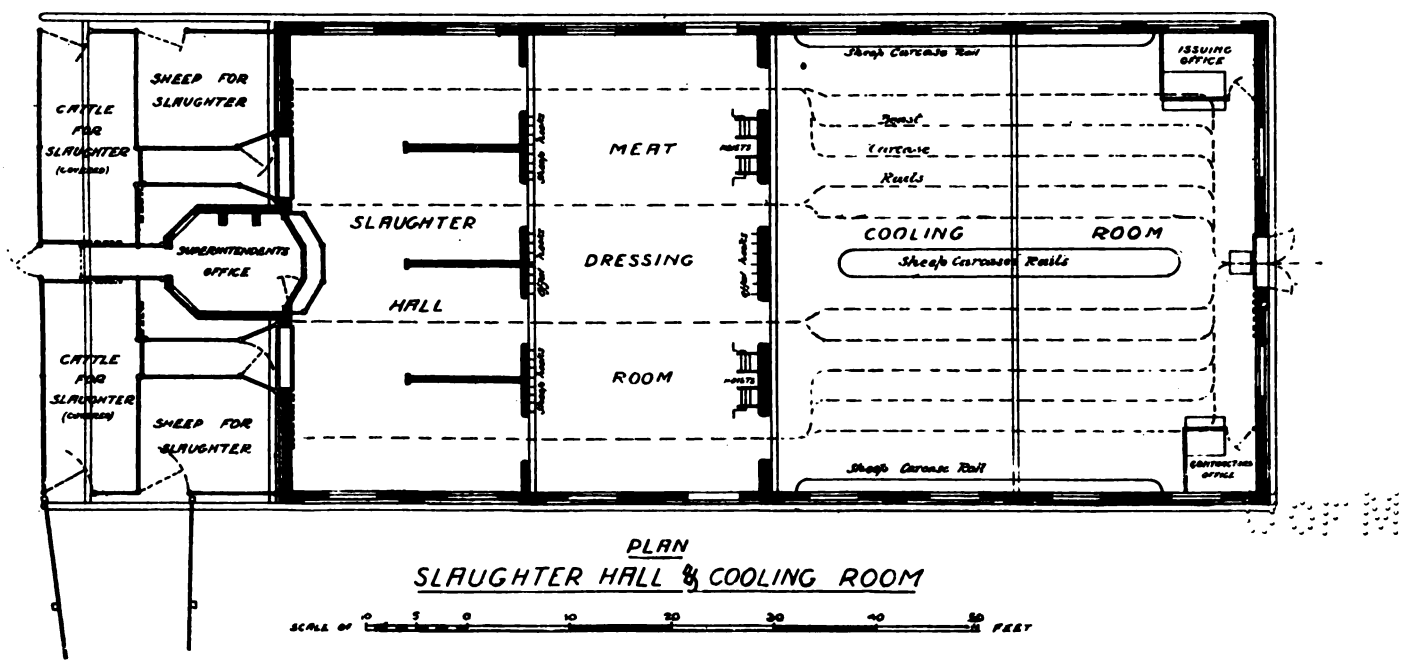
A SHEEP LAIR
B CATTLE LAIR
C FODDER STORE & VEGETABLES.
D SLAUGHTER HALL & COOLING ROOM
E OFFAL HOUSE
F LATRINES & COAL STORE
G SETTLING TANK
H DINING ROOM & STORE
I ROOT STORE
J MANURE PIT
K CATTLE DETRAINING POUND
L EXTENSION LAIRS

BLOCK PLAN

SCALE 100 50 0 100 200 OF FEET



LONGITUDINAL SECTION

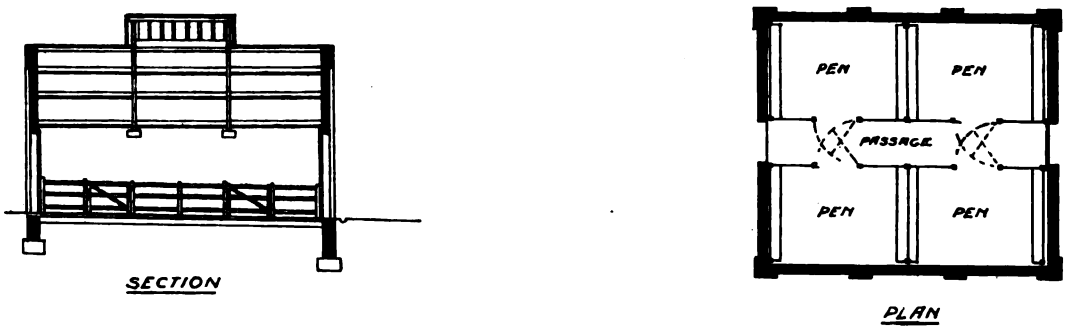


PLAN

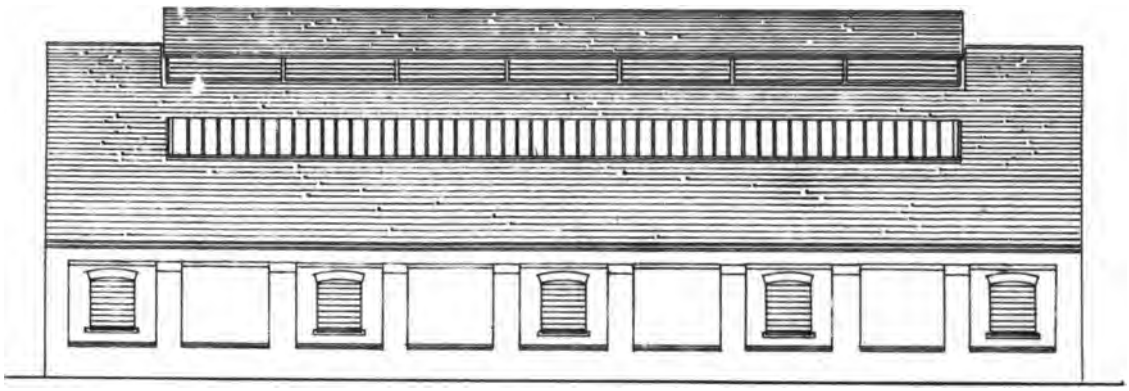
SLAUGHTER HALL & COOLING ROOM

SCALE OF 0 5 0 10 20 30 40 50 FEET

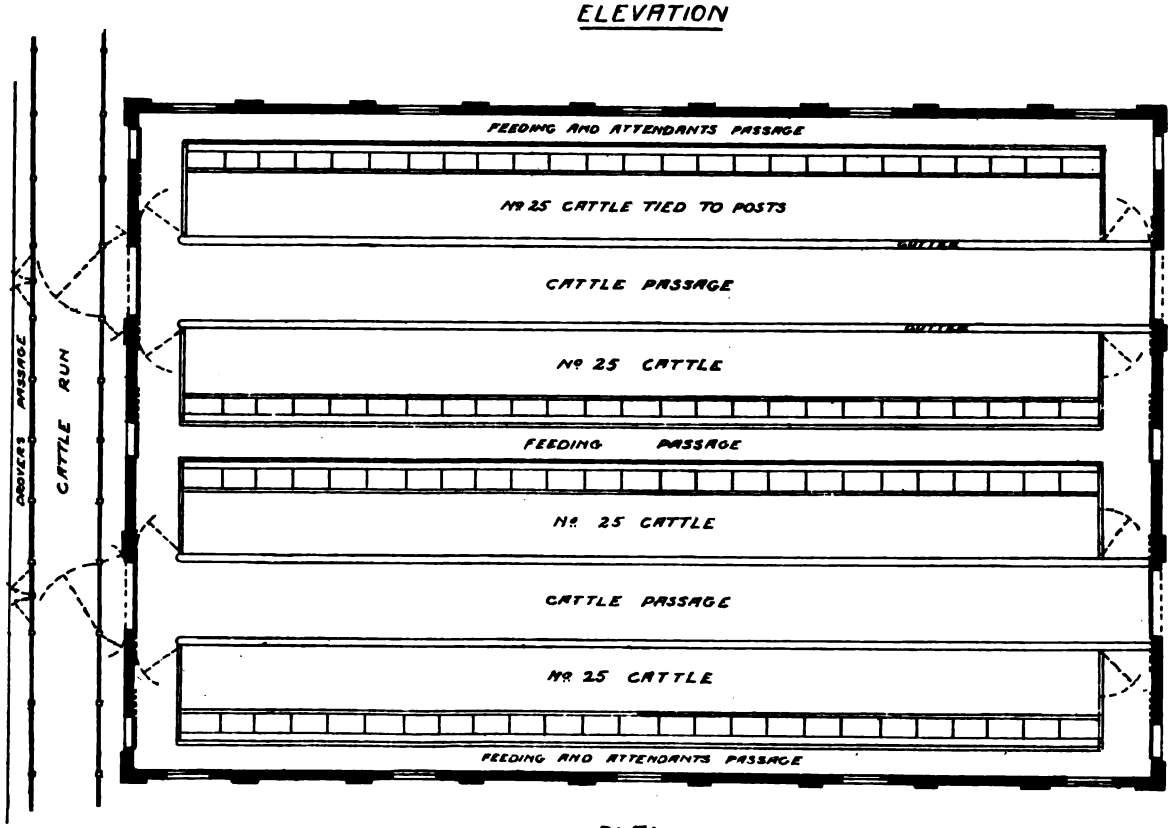
FIG. I. ABATTOIRS AT H. M. DOCKYARD, CHATHAM.



SHEEP LAIR



ELEVATION



PLAN

CATTLE LAIR

SCALE OF FEET

10 5 0 10 20 30 40 50

FIG. 2. ABATTOIRS AT H.M. DOCKYARD, CHATHAM.

DESCRIPTION OF SLAUGHTER-HOUSES.

"It appears to be common practice, even in modern and well regulated slaughter-houses, to keep the animals which are immediately awaiting slaughter in pens which are mere annexes to the slaughter-chamber itself. Moreover, the drainage of the slaughter-chamber is often so arranged that any blood which is not caught and saved together with other refuse, flows out of the slaughter-chamber into or through the waiting pens, under the noses of the animals awaiting slaughter. The committee have witnessed this in slaughter-houses of the largest kind.

"The committee have given careful consideration to the question of the best design for a slaughter-house, and make the following general recommendations:—

"(*a*) The animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughter-house itself.

"There is no point which the committee have more carefully investigated than the question as to whether animals do, or do not, suffer fear from this contact, and the evidence of those best qualified to judge is so conflicting that no absolute verdict can be given. As an animal cannot speak, it is impossible to accurately determine to what extent it does or does not suffer from fear, but there is no doubt that cattle especially, frequently show great reluctance to enter the slaughter-chamber, and can only be dragged in by employment of considerable force. The presumption is that what they chiefly object to is the smell of blood, but whether this can be proved or not, it is obviously undesirable from a purely business standpoint to run any risk, as it appears to be an established fact that the flesh of an animal, killed whilst in a state of fear or excitement, loses some of its marketable and palatable qualities.

"Apart from this, the question is of such vital importance from the standpoint of humanity that it seems clear that the animal should be given the full benefit of the doubt.

"(*b*) With this object in view the waiting pens should be separated from the slaughter-chamber, and the latter should be shut off by sliding doors. It is also of great importance that the pitch of the floor, and the drainage of the slaughter-house, should be away from and not run into the waiting pens, as is often the case at present. The common practice of depositing blood barrels, freshly removed hides, or refuse from the slaughter-house in close proximity to the waiting pens, should also be prohibited.

"(*c*) It is important that the floor of the slaughter-chamber, whilst necessarily impervious, should not be slippery. The smooth concrete floors existing in most slaughter-houses become very greasy when wet, and as a result, cattle, especially

if restive, are very apt to fall down and injure themselves before they can be secured in the proper position for slaughter.

"(*d*) Cattle should, when possible, be slaughtered screened off from their fellows.

This can be arranged in moderate sized abattoirs by dividing up the size of the slaughter-chamber, opposite to the entrance doors, into stalls somewhat similar to those in a stable, but considerably wider. For quiet home-grown cattle a width of 10 feet is sufficient, but where wilder cattle have to be killed a wider space is probably desirable. It is important that these stalls should be so arranged as not to screen the operations of slaughter from the view of the inspecting officials.

"(*e*) Immediately after carcases have been bled, they should be moved on to, and 'dressed' in an adjoining room, screened off from the view of the animals entering the slaughter-chamber.

"This is easily accomplished by hitching a rope (from the winch if necessary), round the head or forelegs of the carcase, and by dragging it along the floor for the short distance (15 feet or so) into the 'dressing room.' The slaughter halls should then at once be flushed down by the hose, so as to remove all traces of blood.

"This method leaves the slaughter spaces clear for the next batch of animals, whereas under the existing system, there is either a loss of time through the slaughter spaces being blocked up by the dressing operations, or else the next batch of animals, on being brought into the slaughter-chamber, are confronted with mutilated and disembowelled carcases.

"This latter circumstance, which is quite usual in existing slaughter-houses, is obviously objectionable from a humanitarian standpoint."

As regards the various recommendations, it will be seen from Fig. 1 that the lairs for stabling beasts and sheep (block plan A and B) are placed near the slaughter-house, and in close proximity to the detraining pound (K). The animals to be immediately slaughtered are brought into pens adjoining the slaughter hall and separated from it by sliding doors. The superintendent's office is situated between the waiting pens and slaughter hall, with windows overlooking each. This is an excellent arrangement, enabling the inspector to command a full view of the whole of the work done in the slaughter hall. It is, perhaps, especially in this part of the building, that an important improvement on the usual method of planning has been made. In most of the existing slaughter-houses, where the open-hall system has been adopted, the animals are rendered insensible, killed and dressed, before the carcases are conveyed to the cooling rooms. These operations necessarily occupy a considerable time, and where many animals are slain in one large hall, the less expert workmen will either keep their companions idle, or other animals will he brought in, smell blood, and see the final operations on those previously killed. These defects are avoided at Chatham, by placing a

meat-dressing room between the slaughter hall and cooling room. The slaughter hall (45 feet by 22 feet), is divided into four compartments by dwarf walls 5 feet high, thus insuring all the advantages of the open-hall system, with none of its disadvantages. In these compartments the animals are stunned and bled, the carcases immediately removed to the meat-dressing room, and the floor flushed down to remove all traces of blood before other animals are brought in. In the meat dressing rooms (45 feet by 22 feet), the carcases are disembowelled, skinned and prepared for admission to the adjoining cooling room (45 feet by 47 feet).

Apart from the fact that the meat-dressing room promotes rapidity and economy of working, it obviates the necessity for the draughty and inconvenient passage usually provided in public abattoirs between the slaughter hall and cooling rooms, for the removal of manure and offal. Inspection is rendered easy, as hooks are arranged against the walls so that the carcases and viscera can be examined together.

The cooling room is fitted with rails for the carcases of beasts and sheep, and also has a small issuing office, contractor's office, and weighing table.

The lairs for cattle (90 feet by 58 feet), are well arranged (Fig. 2) with feeding and attendants' passages between the ranges of fodder troughs. The lairs for sheep (25 feet by 22 feet, are provided with water troughs and fodder racks, whilst ample space has been reserved for future extension of the lairs.

The remaining buildings on the site, are a two-storied fodder and vegetable store (40 feet by 18 feet), offal house (40 feet by 20 feet 6 inches), and a large dining room for workmen, with store attached.

The elevations are simple in character, pleasing in design, and suitable for this class of building. The materials employed are stock bricks for the walling, and Welsh slate roofs. The dado in the slaughter hall is executed in white glazed bricks, and those in the cattle and sheep lairs in the salt-glazed bricks.

The buildings for beasts and sheep have only been completed about twelve months, and that for pigs about six months. Record is kept only of the number of pounds of dressed meat, but, taking the average weight of carcases in this condition, the approximate number of animals killed per annum would be, beasts 4842, sheep 4887, and pigs 6500. I am, however, informed that if necessary, double the number of the above animals could be killed and dressed.

The buildings have been designed in the Admiralty offices, and under the superintendence of Mr. J. Brooker Hunt, Superintending Civil Engineer.

The contractors were Messrs. Wallis of Maidstone, and the cost of the buildings was 9196*l.* (exclusive of foundations, which were executed by the Admiralty), whilst the engineering work was carried out by Messrs. Lockerbie and Wilkinson at a cost of 700*l.*

I am greatly indebted to the officials at the Admiralty for their unfailing courtesy and help. The whole of the drawings were placed at my disposal, and information of every kind most willingly supplied.

South Shields. (Figs. 3, 4, 5.)

Population, 97,267.
Date of erection, 1906.
Cost, 18,000*l.*
Number of animals killed per annum, 40,850.
Architect or Engineer, Mr. S. E. Burgess, M.I.C.E., F.R. San. Inst.

One of the latest additions to the English Abattoirs is that of South Shields, recently opened, which although comparatively small, is very complete. The site has been admirably chosen, being bounded on the northern side by the railway, and the general planning embraces the good points of a small Continental abattoir. Although well situated, the site is irregular in shape, but the designer has very cleverly overcome the difficulties of the problem.

I am taking advantage of the courtesy of Mr. Burgess, by not only illustrating a plan and photograph (Figs. 3, 4, 5) but also a description of the buildings from a pamphlet which he has kindly supplied.

General Description of the Buildings and Arrangements.

The site is situated at Station Road in the centre of the borough, and adjoins the North Eastern Railway goods and cattle sidings. The area is 4,500 square yards, or say one acre in extent.

Communication with the cattle docks or sidings of the railway company has been established by the construction of a subway bridge, thereby providing access directly into the slaughter-house premises. This will obviate the driving of cattle through the streets of the borough, as they will be taken directly from the landing docks in the goods station through the subway.

The slaughtering blocks are planned on the large slaughter hall system, without any cross walls or screens, instead of the cubical or sectional system, where each butcher has a separate department to himself.

Main Entrance, Superintendent's House and Office, and Fodder Store.

The main entrance is from Station Road by means of a slight incline, and immediately on the right as you enter the site are the Superintendent's house and office, with the fodder store adjoining. The accommodation provided in the

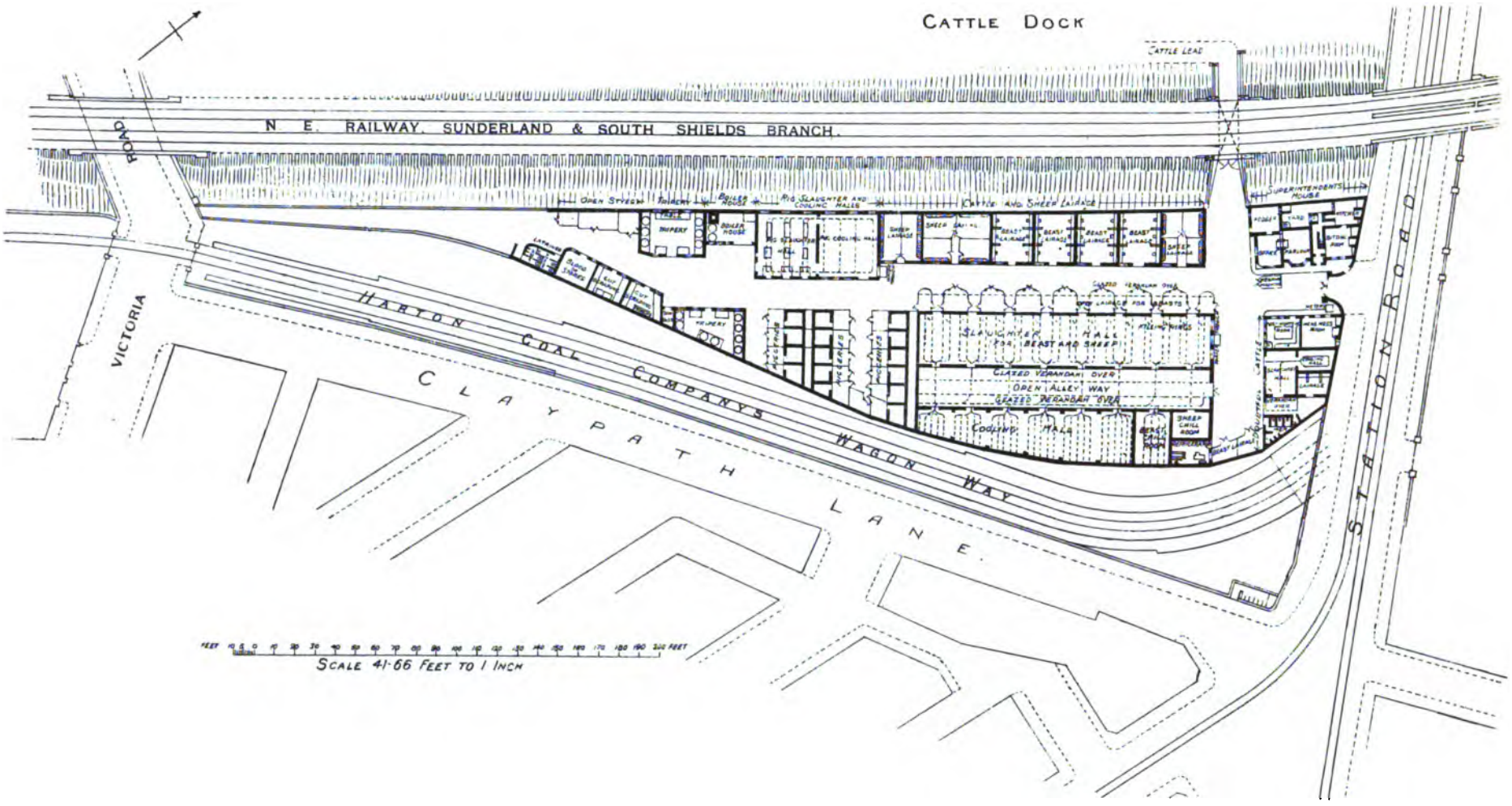


FIG. 3. ABATTOIRS AT SOUTH SHIELDS. GROUND FLOOR PLAN.

FIG. 4.—SOUTH SHIELDS. VIEW OF MAIN SLAUGHTER HALL.

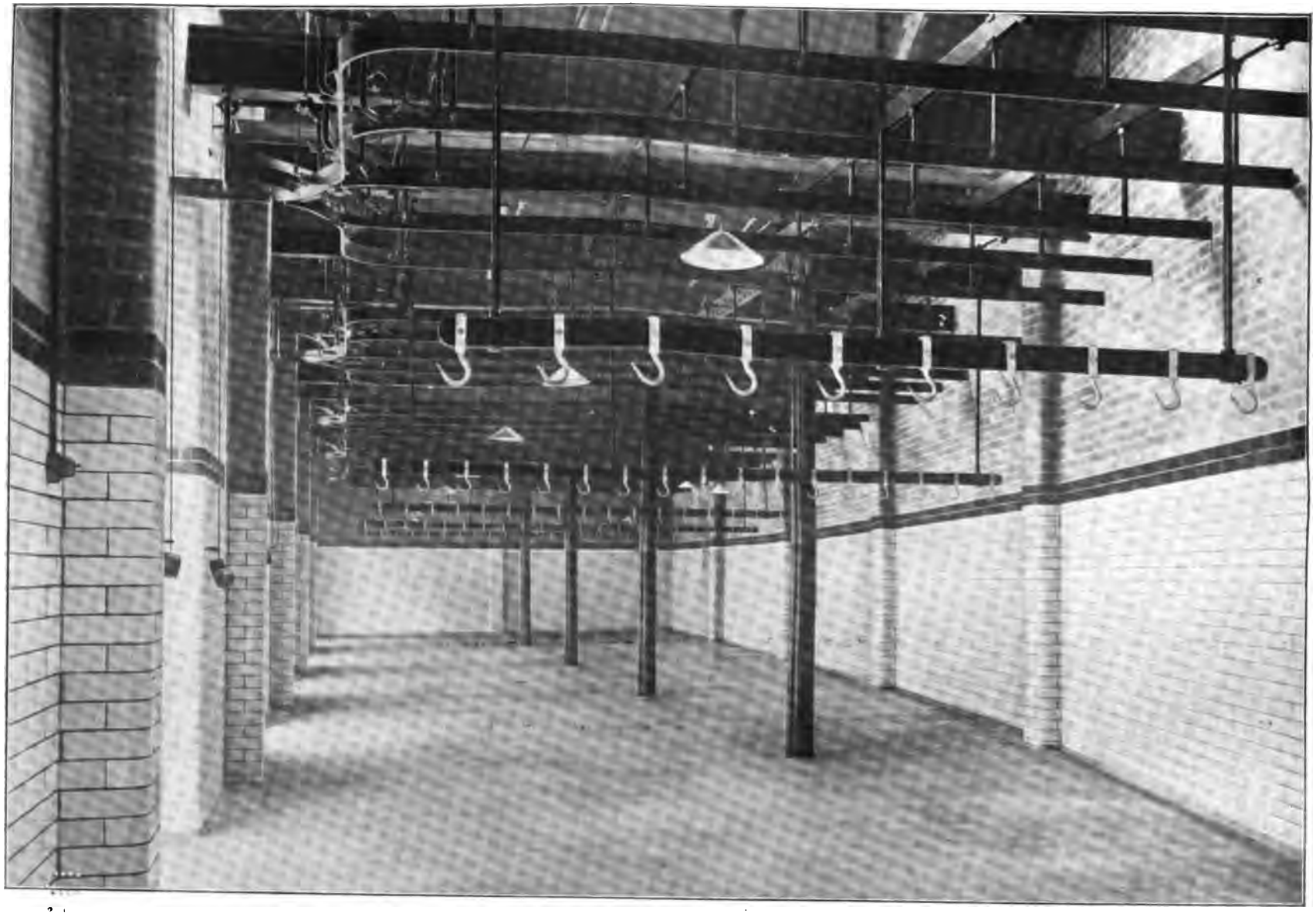


FIG. 5.—SOUTH SHIELDS. VIEW OF MAIN COOLING HALL.

house is as follows: on the ground floor, two living rooms, kitchen, scullery, yard, coals, and w.c.; on the first floor, two bedrooms, with bath and lavatory; and on the second floor two bedrooms.

The office is at an angle of two roads, one from the subway and one from the main entrance, so that entrance and exit to and from the premises can only be made by passing the office, thus preventing anything being taken in or out without the superintendent's knowledge.

At the front of the office there is an Avery's patent weighbridge, to weigh anything to a maximum of five tons. The register of the weighbridge automatically stamps the weight on the tickets, and thus provides against liability to mistaken entry on the weigh ticket.

Lairage.

The lairage for cattle, calves and sheep abuts both on the railway embankment and subway, thus enabling the cattle to be taken from the landing dock by a very short and easy way, the distance being reduced to a minimum. This building is 156 feet long by 23 feet broad, and is divided into seven compartments, three of which are for sheep and four for cattle.

The lairs provide accommodation for 700 sheep and 100 cattle. Each lair is separated from the adjoining one by 9-inch cross walls, 8 feet in height, thus assisting in the ventilation by permitting a current of air to flow from end to end of the whole of the building.

The building is lighted from the north by skylights in order to keep the place as cool as possible, and for through ventilation, in addition to the longitudinal louvres, semicircular windows facing the main alleyway are provided.

Sliding doors are fixed to this building, the upper part of which are provided with a grill, in order that the cattle may be seen without the necessity of opening the door.

Main Slaughter Hall.

The main slaughter hall is 146 feet long by 27 feet broad, separated from the lairage by an alleyway or main road 24 feet wide, sufficient to provide isolation and ventilation, and still be within easy and convenient reach.

There are no cross walls or projections in the slaughter hall, so there is no tendency to harbour any deposit, and the whole building is under the complete supervision of the official in charge of the premises.

The building is lighted by semicircular windows at the sides and ends, and also by skylights, and fitted with the latest appliances used in connection with slaughter-houses. Through ventilation is obtained, and roof louvres are also constructed the entire length of the building.

At a height of 13 feet 6 inches from the ground, and at intervals of 8 feet throughout the whole length of the building, steel cross girders are fixed on stone templates. To these girders the overhead trolley lines which run from the slaughter hall across the ventilation alley into the cooling hall are fixed.

After the beasts are killed, the carcases (after dressing) are lifted by means of patent winches on to hooks attached to the trolley rail, and on these overhead trolley lines carcases are conveyed in an easy manner to the cooling hall without inconvenience or trouble.

In addition to the killing rings, and appliances for cattle slaughter, there are seven stands running the whole length of the slaughter hall for sheep slaughter. On each of these stands two crutches will be placed, thereby providing twenty-eight standages for the slaughter of sheep in addition to the sixteen standages for cattle slaughter. These are all provided in the one common slaughter hall.

Provision has also been made by rails and hooks for hanging up sheep, etc., during the process of slaughtering and dressing. There are sixteen doors, eight facing towards the lairage, and eight facing the cooling hall, all made to slide and to occupy the least space in opening and closing. The doorways on the cooling hall side are 12 feet 6 inches in height, so as to permit the trolley lines to have a clear passage through and across the alleyway into the cooling hall.

Along the whole length of the northern side of the building, a glass verandah 8 feet from the ground and projecting 6 feet is provided. This verandah is constructed on cantilevers so as to avoid pillars and other such obstructions on the outside in the alleyway.

Under this verandah the space between each of the doors into the slaughter hall is utilised for open standage for cattle, formed with posts and railings. The floor inside the standage is paved with *in situ* concrete, and grooved and throated. These standages were designed and constructed so that cattle and sheep can be driven direct from the landing dock and placed in the open standage previous to slaughtering, when the slaughtering of same is to take place within a few hours.

Main Ventilating Alley.

The cooling hall and beast slaughter hall are separated from each other by an open ventilating roadway or alley 19 feet wide. Across this alley run the trolley lines joining the slaughter hall to the cooling hall.

On each side of the alleyway is a glass verandah, similar in construction to the one described on the north side of the slaughter hall, but the height is 14 feet and projects 6 feet. This enables the conveyance of carcases by the overhead trolley lines from the slaughter hall to the cooling hall to be carried out under all conditions of weather.

Cooling Hall.

The cooling hall, i.e. storage for cooling and stiffening, is 107 feet long by 20 feet broad, and will accommodate the carcases of 500 beasts, sheep and other animals.

The construction is similar to the slaughter hall and fitted up in like manner, but is lighted only from the north, so as to keep the building comparatively cool.

Cold Storage.

At the east end of the cooling hall, specially constructed cold stores are provided, one for beasts, etc., and the other for sheep, poultry, butter, and such like. The refrigerating plant and engine in connection therewith are located in the adjoining room. The cold stores can only be entered from the ventilating alley, there being no direct entrance to such stores from the cooling hall.

The refrigerating plant is capable of maintaining a temperature of 35 degrees in the two rooms which have a combined capacity of 6500 cubic feet. These rooms are insulated throughout, i.e. the walls, ceilings and floors are packed with slag wool and made proof against the outside atmosphere.

The apparatus consists of an ammonia compressor, air cooler and fan. The belt of the compressor is driven by a 14 H.P. Crossley gas engine. The air is driven over the coil, which is fixed in a duct, by a Blackman's fan belt-driven and cooled by the evaporation of the ammonia in the coil, and is then, as cold air, discharged from the duct by a series of openings in the chilling rooms. These openings can be regulated to suit the varying requirements of the rooms.

Doubtful Cattle.

The block or pavilion adjoining Station Road, on the left of the entrance, contains a specially constructed lair for isolation purposes, and in conjunction therewith there is a separate and distinct slaughter and cooling hall, of similar construction to the larger slaughter hall.

This pavilion is for dealing with cattle of a doubtful or diseased nature, and is separated or isolated from the main slaughter and cooling halls by a roadway 25 feet wide.

The block also contains doctor's dissecting or post-mortem room, fitted with dissecting table and small lavatory.

Haulage machinery, winches and trolley lines are also provided to the doubtful cattle slaughter hall.

Men's Quarters.

Adjoining the doctor's room, and immediately alongside the main entrance, are the men's quarters. These consist of a room 15 feet square, fitted with a kitchen range, lockers, seats, etc. The building is for the use of slaughtermen and other workmen employed on and about the premises, and is consequently located in full view of the superintendent's office for supervision.

Piggeries.

The pig slaughter and cooling halls and piggeries in connection therewith are grouped so as to form a separate and distinct set of buildings entirely apart from the cattle, sheep, etc.

The piggeries consist of two buildings, one 54 feet long by 14 feet wide, abutting the end of the cattle slaughter hall, covered with a lean-to roof, and the other building 38 feet long by 24 feet wide standing by itself. These buildings contain altogether 18 covered lairs for pigs; in addition there is open standage capable of accommodating at least 300 pigs.

Throughout the length of each building there is a raised alleyway 4 feet wide so that the pigs may be inspected under cover. The piggeries are quite apart from the scalding and cooling halls, although in close proximity thereto for easy handling for slaughtering purposes.

Pig Slaughter and Cooling Halls.

The pig slaughter and cooling halls are contained in one building 60 feet long by 30 feet wide facing the piggeries and separated therefrom by an alleyway 14 feet wide.

The pig slaughtering block is fitted with apparatus and overhead equipment similar to that in the cattle slaughtering hall. In addition there are large scalding tanks, scraping tables, winches, etc. complete.

Tripery.

Provision is made on the site for tripe preparing and boiling. Two buildings are fitted with specially prepared benches and tables, and provided with 14 large boiling-pots each of which has a capacity of 80 gallons of water, which are rapidly heated by steam injection.

One tripery is 30 feet by 17 feet, and immediately abuts on to the boiler house. The other is 36 feet by 16 feet 6 inches directly opposite. It will be noted that although the triperies are far enough removed from the slaughtering, they are sufficiently near for efficient and practical working.

Gut-Scraping, Hides, Etc.

The block or pavilion at the extreme west end of the site contains two rooms for gut-scraping, and a room for the storage of hides, or for other useful purposes. This block is 55 feet long by 15 feet wide, and covered with a lean-to roof.

Each gut-scraping room is provided with two elongated slate slabs 15 feet long by 3 feet wide, one on each side of the building, and also there are two troughs each 4 feet by 1 foot 6 inches provided with hot and cold water, for the use of the persons employed at gut-cleansing.

Boiler House.

The boiler house is situated between the triperies and pig slaughter hall, and contains two vertical boilers.

The steam will be thrown by jets into the cold water in the various scalding tanks, boilers, and other appliances. Proper regulators and cocks are provided in convenient positions for this purpose.

The door to the fire-box of one of the boilers has been increased in size in order to permit of the destruction by burning of diseased and condemned meat.

Sanitary Conveniences.

Latrines and urinals, together with w.c.'s are provided at various parts of the site for the accommodation of workmen, and others working on the premises, provision being made in this respect for both males and females.

General Construction.

The construction of the building has been generally carried out in brickwork with Pelaw double pressed facing bricks. The interior wallings of all the various buildings with the exception of the superintendent's house and boiler house, have a dado of either white glazed or brown salt-glazed brickwork, and the exterior walls of all the blocks are finished in brown salt-glazed brickwork up to a height of 4 feet 6 inches from the ground.

All the floors, with the exception of the superintendent's house, are of Portland cement concrete, cambered and graded towards channels at the sides so as to assist in the general cleanliness of the premises.

The roofs are carried on steel principals with close boarded sarking, and covered with Dinoric slates.

Quoins, copings, sills, heads, and watertabling are carried out with compressed concrete. The windows and doorheads and sills are of reinforced or armoured concrete.

The buildings are ventilated by means of louvres fixed along the entire length of the ridges. All the buildings which it is advisable to keep cool are lighted only from the north. Through ventilation has been carried out in every case.

Standpipes for the plentiful supply of water are fixed throughout the various departments, and also in the roadways in convenient positions. The lighting throughout is by electricity. All the roadways are paved with granite setts on a concrete foundation, and grouted with bitumen.

Drainage.

Special attention has been given to the drainage, and a comprehensive scheme, with main outfalls to the public sewer at Victoria Road, is provided. The drains are carried out with glazed earthenware socketed pipes jointed with Portland cement and spun yarn, and laid on a foundation of Portland cement concrete, and made perfectly water-tight.

The main drain runs the full length of the roadway from east to west commencing at a man-hole near the superintendent's office, and joins the main sewer at a new manhole in Victoria Road. Throughout this length manholes are fixed at the various changes both in direction and in gradient, and also at the junction with all main branch drains.

There are thirty specially made large siphon-trapped gulleys in the main road, into and upon which the channels from the various buildings discharge. These gulleys are connected to the main drain by 6-inch pipes.

Each building or block is separately drained and intercepted by inspection chambers, interceptor trap, air inlets and upcast ventilators complete. The drains of each department are eventually connected together, and after passing through the main interceptor chamber, discharge by a 12-inch outfall into the main sewer. All the drains have through ventilation by outlets carried up above the roofs at the extreme and opposite ends of the various drains.

Flushing shafts are fixed at the top end of all main and branch drains.

During the construction of the abattoirs, an important scheme of bridge and roadway improvement designed by the borough engineer was adopted by the Town Council, and the constructional work has been carried out. The work undertaken included the abolition of the old waggon-way level crossing over Station Road, immediately opposite the main entrance to the slaughter-house, and the awkward gradient of Station Road bank has been done away with. This work has greatly improved the entrance to the slaughter-houses: the quadrant approach thereto will hereafter facilitate the traffic to and from the buildings.

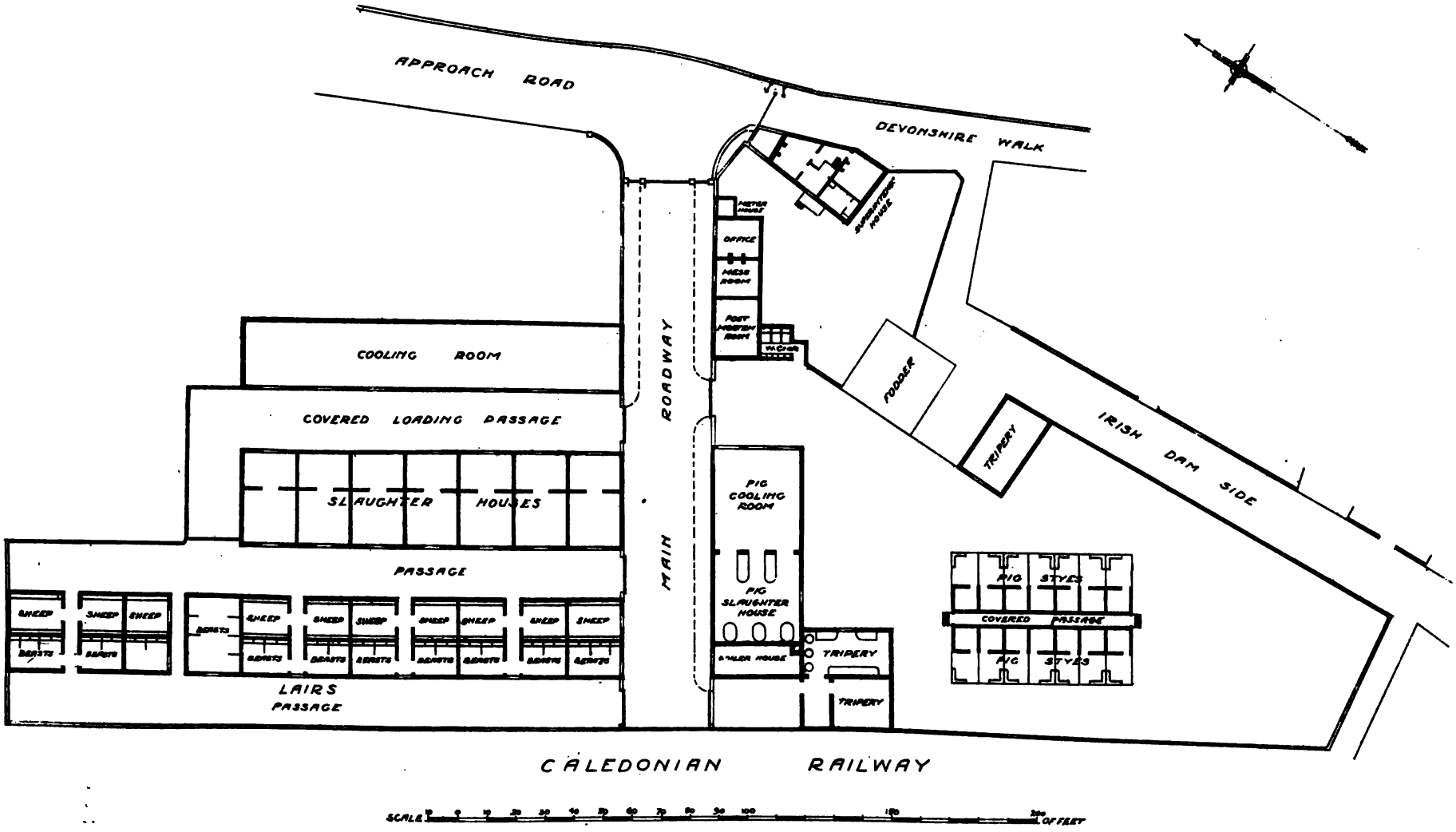


FIG. 6. CARLISLE. GROUND FLOOR PLAN.

Mechanical Equipment.

The engineering work has been very carefully considered. The weighing machine is one of Avery's patent, and automatically stamps the weight on tickets, in the office adjoining.

In the slaughter hall and cooling hall a complete system of overhead trolley lines has been arranged. The carcases are lifted by means of patent hand hoists and conveyed across the alleyway to the cooling hall.

The refrigerating plant consists of an ammonia compressor, air cooler, and fan. By this arrangement air is driven over a coil by a Blackman fan, cooled by the evaporation of ammonia and discharged into the chill rooms by means of openings which are capable of regulation.

The pig slaughter hall, cooling hall, and also the slaughter hall and cooling hall for doubtful cattle, are provided with a system of overhead trolley lines and patent hoists as above. The boiler house is fitted with two vertical boilers each 3 feet 6 inches diameter, by 8 feet 6 inches high. These boilers supply the steam necessary for the triperies, gut-scraping and pig slaughter hall.

The general contractors for the works were Messrs. Robert Neill and Sons, of Manchester, and the mechanical equipment was carried out by Messrs. Lockerbie and Wilkinson, of Birmingham and Tipton.

CARLISLE. (Fig. 6.)

Population, 45,478.

Date of erection, 1886; and subsequent additions.

Cost, 8,000*l.*

No. of private slaughter-houses: two, held by railway companies.

No. of animals killed per annum, 12,310.

Architect or engineer: Original buildings by Mr. Hugh N. McKie, M.I.C.E.; extensions, Mr. Henry C. Marks, M.I.C.E., City Engineer.

This site is about 2½ acres in extent, although the portion at present occupied by buildings and roads is only about half of this area. The western portion of the site is bounded by the Caledonian Railway. The buildings are situated about a quarter of a mile from the general butchers' market, and half a mile from the principal butchers' shops. Although not far away from dwellings, no complaint has been made of nuisances arising from it. The lairs are arranged parallel to the railway, and accommodation is provided for 60 beasts and 400 sheep. The slaughter-houses are divided from the lairs by a roadway 16 feet wide, and are on the separate system, but are not let

to individual butchers. They are seven in number (each 18 feet by 18 feet) and also 7 smaller ones (each 18 feet by 12 feet). In the original scheme these latter were cooling rooms, but in 1903 a fine new cooling room (130 feet by 21 feet) was erected, and the old cooling rooms converted into additional slaughter-houses.

Between the slaughter-houses and the cooling room is a covered loading passage, 20 feet in width.

The pig-styes are placed at the southern end of the site, and are 14 in number, capable of accommodating 210 animals. Between the two blocks of styes a raised inspection passage is arranged.

Placed near the styes are the pig slaughter-house (30 feet by 30 feet), pig cooling room (30 feet by 35 feet), boiler-house (30 feet by 10 feet) and tripery (30 feet by 33 feet). An additional tripery (30 feet by 16 feet) has recently been added.

The remaining buildings on the site are a superintendent's house, office, men's mess-room, post-mortem room, meter house, and the usual conveniences.

The engineering equipment consists of overhead rails and runners from the slaughter-houses to the cooling rooms. Three scalding tubs are provided in the pig slaughter-house, the water for which (and also for the tripery) is heated by steam from the boiler adjoining.

The whole of the butchers in the city kill at the abattoir, and they are compelled to use the Greener humane killer for cattle, and Koch's patent killer for pigs. The charges for slaughtering are: beasts *1s.*, calves *6d.*, sheep *2d.*, pigs from *3d.* to *6d.*

West Hartlepool. (Fig. 7.)

Population, 62,614.
Date of erection, 1895.
Cost, 8,172*l.*
No. of private slaughter-houses: one, in outskirts of borough.
No. of animals killed per annum, 24,170.
Name of borough engineer, Mr. Nelson F. Dennis, A.M.I.C.E.

The site occupies an area of about four-fifths of an acre, and has a railway siding for the delivery of animals and for the conveyance of meat. Adjoining the siding are two raised unloading pens for animals coming by railway, and in close proximity to the lairs and pig-styes.

The lairs for cattle and sheep (115 feet by 50 feet) are lighted by skylights, with louvred ventilators in the roof, and are divided into 18 compartments (6 for

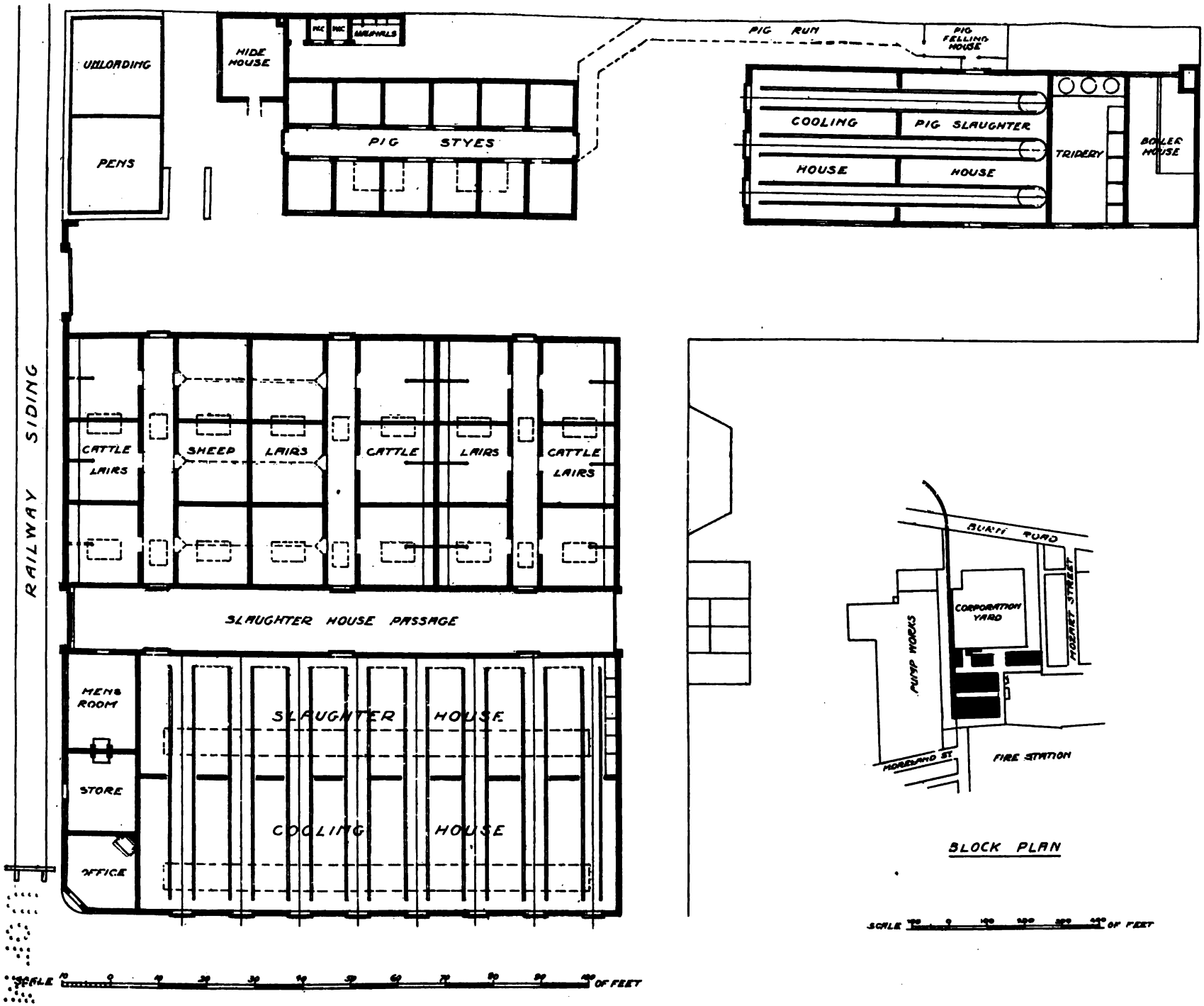


FIG. 7. WEST HARTLEPOOL. BLOCK & GROUND FLOOR PLAN.

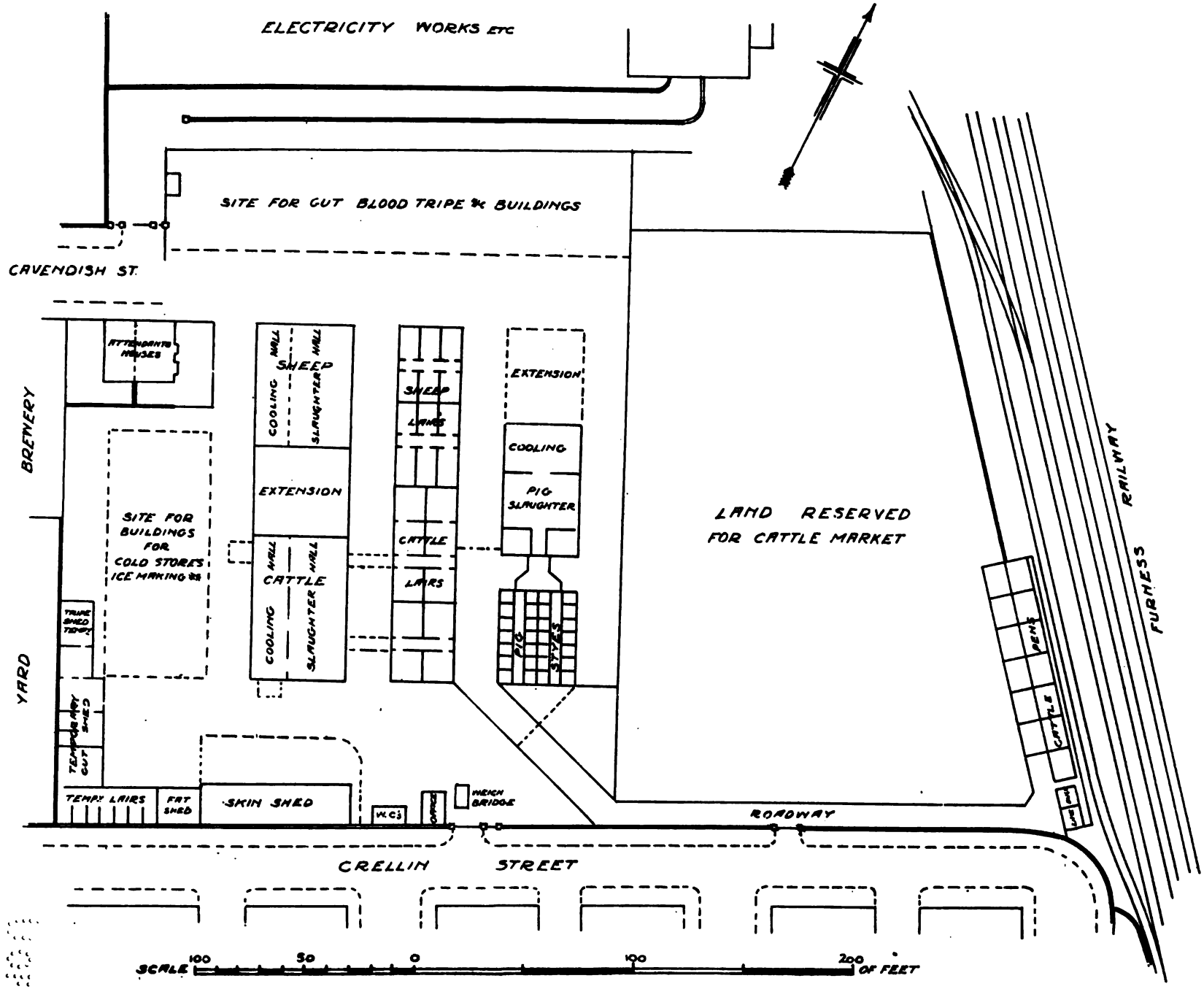


FIG. 8. BARROW-IN-FURNESS. BLOCK PLAN.

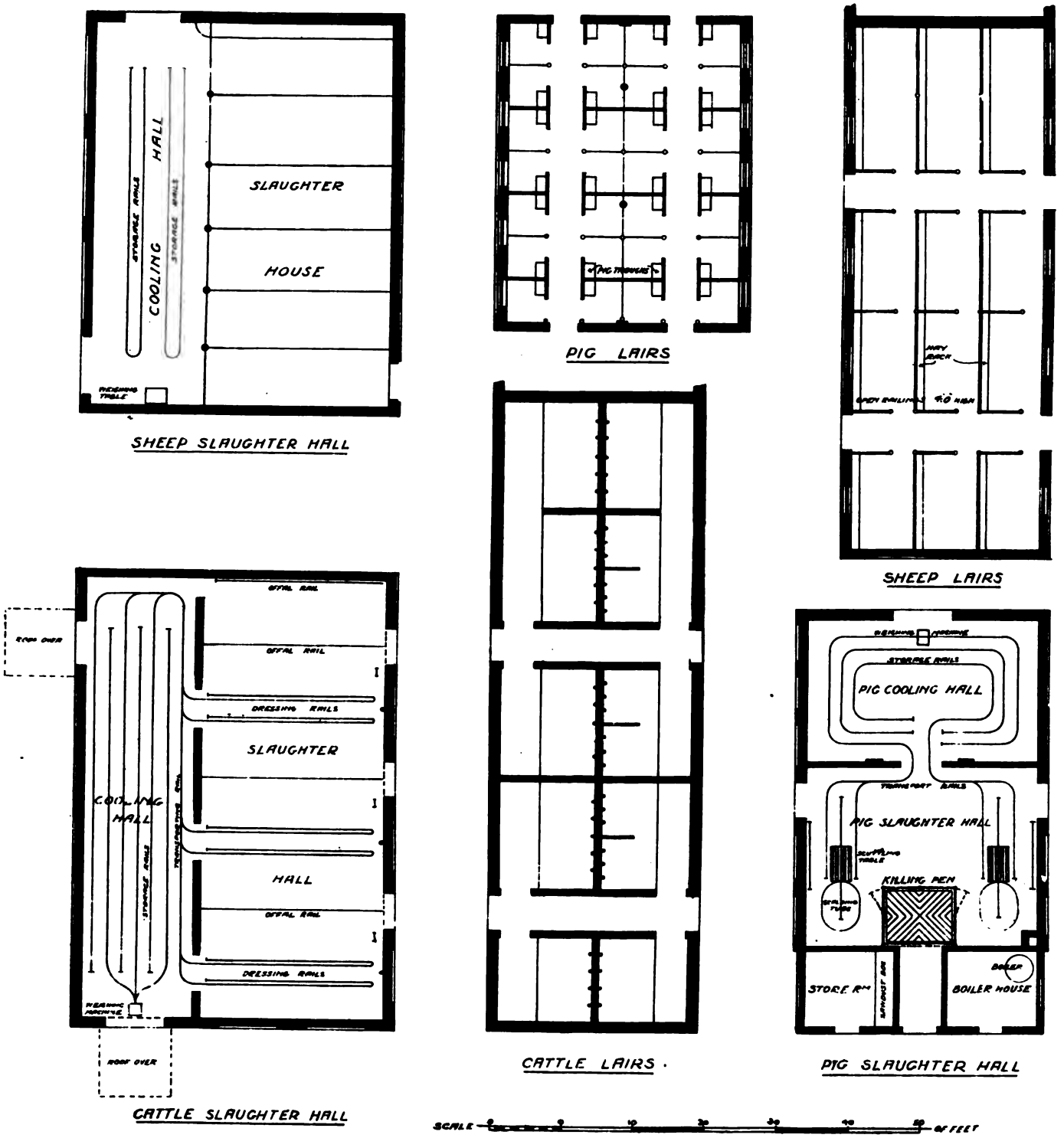


FIG. 9. BARROW-IN-FURNESS. PLANS OF LAIRS. COOLING HALLS. SLAUGHTER HALLS. ETC.

sheep and 12 for cattle) by walls not carried up to the height of the roof, so that ample ventilation is obtained by the louvred ventilators extending along the whole length of the roof.

The lairs are separated from the slaughter-house by an open passage 12 feet wide.

The slaughter-house (115 feet by 25 feet) is on the "open hall" system, and is separated from the cooling house (115 feet by 25 feet) by a wall perforated by 8 large arched openings. Here also, ample light and ventilation are obtained by skylights and louvred openings in the roof.

Twelve pig-styes are provided, together measuring 60 feet by 25 feet.

The pig slaughter-house (30 feet by 30 feet), cooling house (30 feet by 30 feet), tripery (14 feet by 30 feet), and boiler-house (14 feet by 30 feet) are placed under one roof, and are well lighted and ventilated from the roof in addition to the windows as shown on plan.

A small "pig felling house" is arranged at the end of the "pig run" from the styes, which enables the slaughterers to render the animals insensible before they are brought into the slaughter-house. This is an admirable arrangement.

The remaining buildings on the site are hide house, men's mess room, store, office, and the usual conveniences.

The general plan of this abattoir is an excellent one, and with some slight variations and additions most suitable for a town with about the population of West Hartlepool.

Barrow-in-Furness. (Figs. 8, 9.)

Population, 57,584.

Date of erection, 1901–6.

Cost, 16,500*l.*

No. of animals killed per annum, 24,600.

Architect or engineer: Mr. J. Walker Smith, Borough Engineer and Surveyor.

These buildings are at present a portion only of a comprehensive scheme to be completed in the future. The site is conveniently situated, and is bounded on the eastern side by the Furness railway, with a private siding to the loading bank, where there are a range of lairs, in which the animals are kept temporarily before being driven to the large lairs.

The area allocated to the existing and future abattoir buildings is about two acres, whilst adjoining is an area of about one acre, reserved for a future cattle market.

The lairs for cattle (87 feet by 26 feet internally), and sheep (73 feet by 26 feet), are divided from the slaughter halls by a roadway 20 feet wide. The cattle lairs are planned to accommodate 65 beasts, whilst those for sheep are arranged to shelter 360 animals. Separate slaughter halls are provided for cattle and sheep, the former 62 feet by 26 feet and the latter 54 feet by 26 feet. In each case the cooling rooms adjoin the slaughter halls, and are about 15 feet wide.

At the eastern end of the site a large range of pig-styes have been erected (42 feet by 32 feet), with accommodation for 112 animals. The styes are connected by a railed inclosure to the pig slaughter hall (32 feet by 25 feet), cooling hall (32 feet by 20 feet), and boiler house and sawdust store.

The remaining buildings comprise an office, skin shed, fat shed, and temporary lairs, gut and tripe sheds. Two houses for officials are to be built forthwith, and a cold store and ice-making plant will be eventually added.

The engineering equipment is very complete. Overhead dressing and running rails are provided throughout. A weighbridge is placed near the office, and a weighing machine is placed in each of the three cooling halls.

All the butchers in the town use the public abattoir, as the Corporation have within recent years gradually closed the private slaughter-houses.

The charges for slaughtering are very moderate, viz.: per beast 1*s.*, per calf 4*d.*, per sheep 2*d.*, per pig 6*d.* As these charges include the use of lairs, water, tools, appliances, etc., it will be seen that in addition to the hygienic, utilitarian and humane advantages, the butchers are enabled to slaughter at much less expense than they could in their own private slaughter-houses.

Birkenhead. (Fig. 10.)

Population, 110,926.
Date of erection, 1887.
Cost, 9737*l.* (exclusive of site and roads).
No. of private slaughter-houses, 1.
No. of animals killed per annum, 18,775.

These buildings are situated in the New Chester road, and when erected the eastern portion abutted on the river Mersey. Since that date, however, a portion of the foreshore has been reclaimed, thus depriving the abattoirs of the advantage of the river frontage.

Large cattle and sheep lairs are provided on the southern side of the site, adjoining the slaughter-house (118 feet by 25 feet), which is on the open hall system. A partially covered roadway about 10 feet wide separates the slaughter-

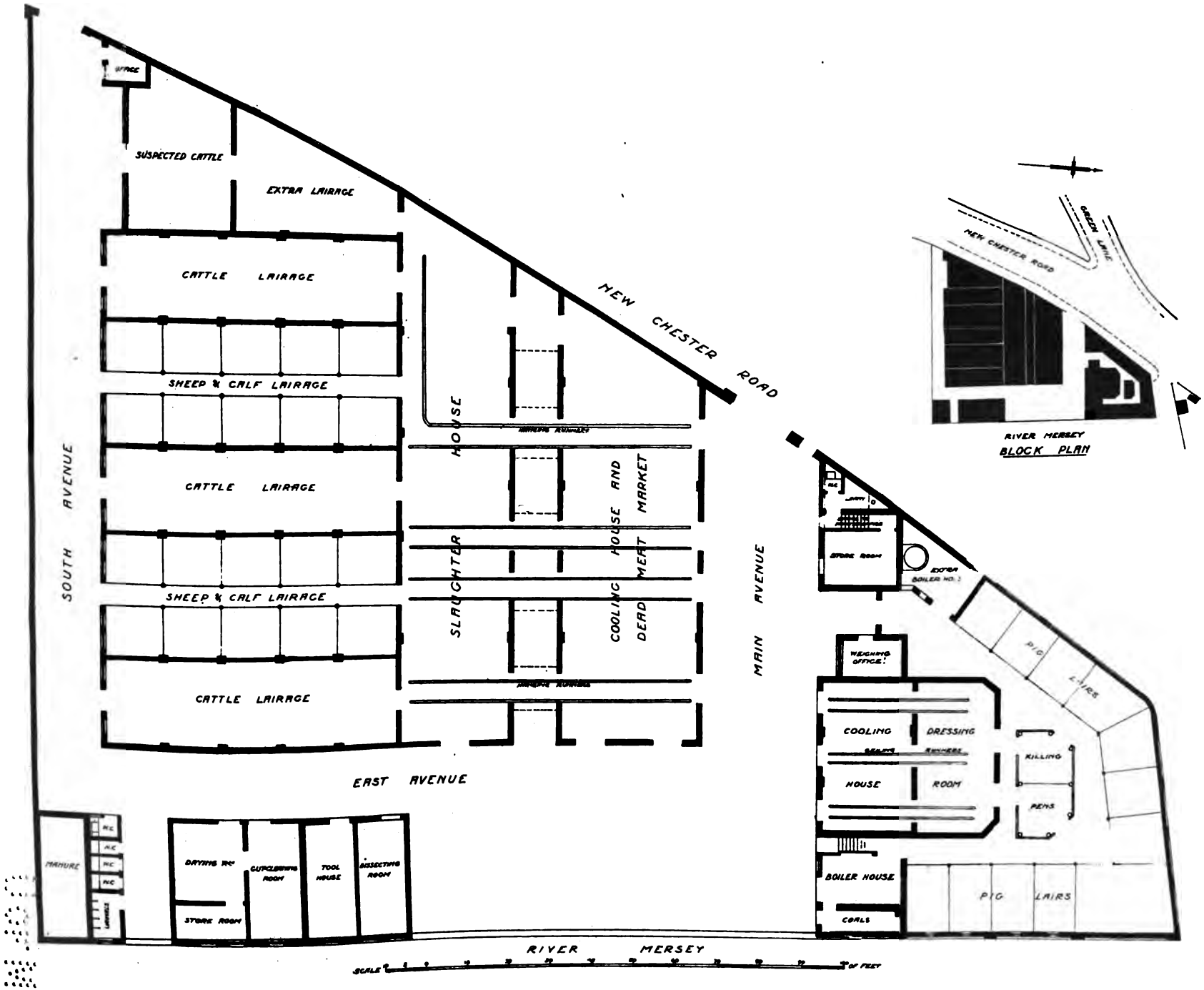
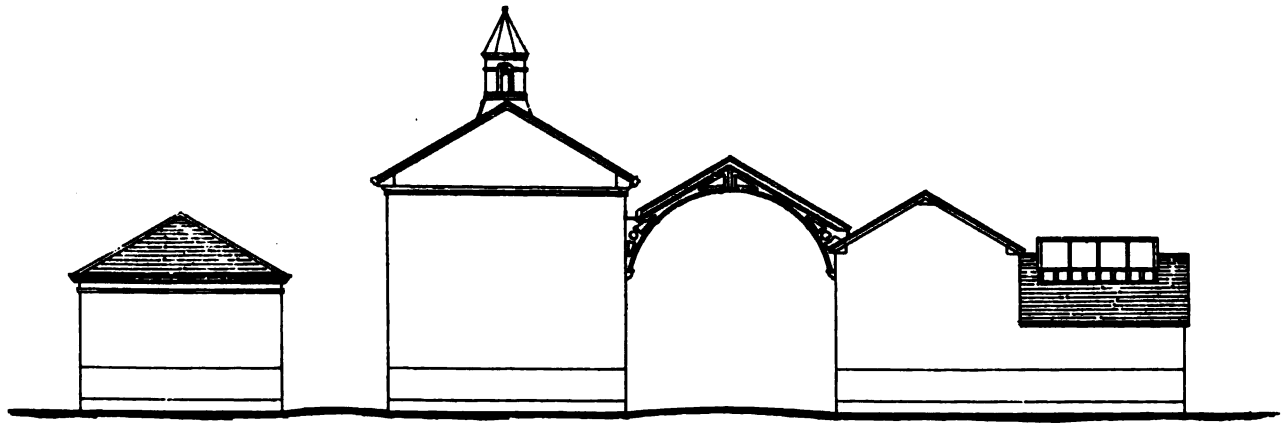
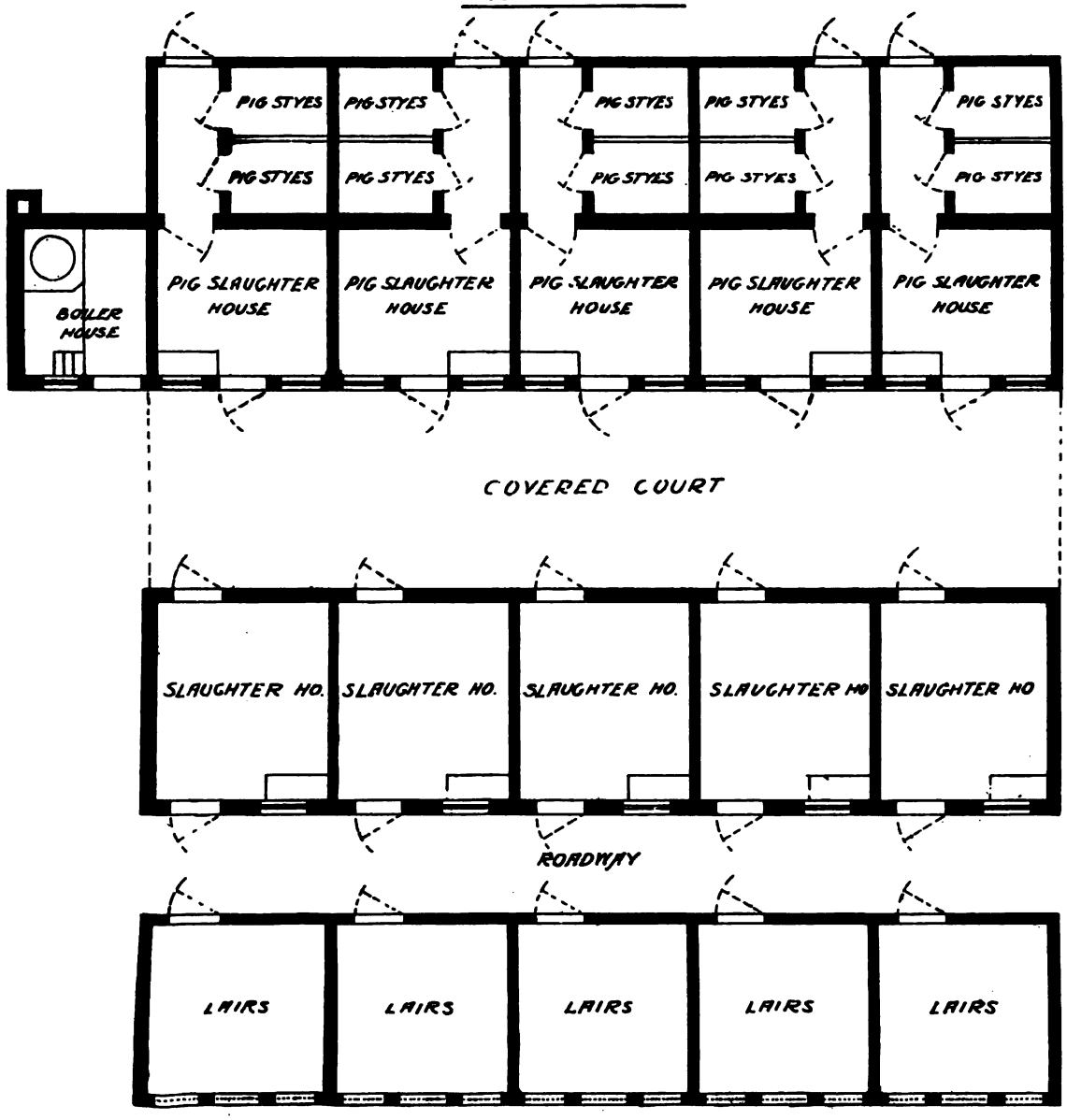


FIG. 10. BIRKENHEAD. PLAN.



END ELEVATION



PLAN

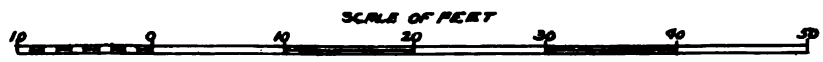


FIG. 11. CHELTENHAM. PLAN & ELEVATION.

house from the cooling house (92 feet by 34 feet), which is also used as a dead-meat market.

A large block of buildings are arranged on the northern portion of the site, containing pig-styes, killing pens, carcase-dressing room (35 feet by 18 feet), and cooling house (35 feet by 21 feet).

Adjoining the south entrance is a small office and lairage (24 feet by 35 feet) for suspected cattle.

The usual office and administration accommodation is provided, and also dissecting room.

There is only one private slaughter-house in the borough, but the buildings are, unfortunately, not financially successful, owing to the fact that the enormous abattoir for foreign cattle is almost adjacent. Some few years ago, Mr. Thomas Gregory, superintendent of the markets, wrote, in answer to a letter from the Model Abattoir Society: "We have extensive lairages for the slaughter of foreign animals within 400 yards of our own abattoir, where many thousands of animals are slaughtered every week, and there the great majority of our butchers go, and purchase carcases instead of purchasing the animals alive. Foreign carcases can be purchased at a less price than English carcases, so you can see, as far as our town abattoir is corcerned, it is not above one-fourth patronised, as it would be if there were no foreign animals slaughtered here. But we can boast as a Corporation, that we are free from the many and intolerable nuisances which exist in many towns through private slaughter-houses. Any persons found slaughtering an animal outside the public abattoir for sale in Birkenhead, are liable to a fine of 5*l.* So far, then, we have perfect inspection of all meat slaughtered in the borough, and that is worth something to the general public.

"If the abattoir does not pay in cash receipts direct, we have many advantages as regards health, etc., which towns do not enjoy when infested with private slaughter-houses. Again, we permit no cruelty to be practised to the animals in the abattoir, no blowing or stuffing of carcases to cause them to appear deceptive."

CHELTENHAM. (Fig. 11.)

Population, 49,439.

Date of erection, 1891.

Cost: The portion now erected cost 2500*l.* and is part of a complete scheme designed to meet the wants of the town, at an expenditure of 11,000*l.*

No. of private slaughter-houses in the town, 18.

No. of animals killed per annum, 6500.

These buildings were designed by Mr. J. Hall, late Borough Surveyor.

The lairs for beasts and sheep are placed near the slaughter-houses and separated from them by a roadway about 8 feet 6 inches wide. The slaughter-houses are five in number, and are arranged on the separate system.

A large covered court connects these to the pig-styes and slaughter-houses.

In reference to these buildings, it is interesting to note that the Medical Officer of Health states: "Undoubtedly the seizures at public abattoirs of diseased meat are out of all proportion to seizures elsewhere."

St. Anne's-on-Sea. (Fig. 12.)

Population, 6,807.

Date of erection, 1902–4.

Cost, 2,650*l.*

No. of animals killed per annum, 2400

Architect or engineer, Mr. G. Hodgkinson, A.M.I.C.E., and Mr. Henry Gregson.

The site occupied by these buildings is about an acre in extent, and adjoins the railway. At present only a portion of the scheme has been carried out, but the site is sufficiently large to allow the existing accommodation to be doubled.

The lairs (40 feet by 35 feet) are lighted by skylights in the roof, and have a central gangway for feeding.

Two slaughter-houses are provided, each 30 feet by 29 feet.

Four small cooling rooms, each 18 feet by 10 feet, are placed at the ends of the slaughter-houses, with entrances from the same, and are also connected by a meat exit 8 feet wide.

Two large cattle-pens, each 29 feet by 20 feet, are provided, in which the animals about to be slaughtered are stabled.

Under the original scheme pig slaughter-houses were erected, but they have recently been converted into lairs, pens, and two slaughter-houses, and are let to two butchers at an annual rental.

St. Helen's, Lancashire. (Fig. 13.)

Population, 84,410.

Date of erection, 1895.

Cost, 6,750*l.*

No. of private slaughter-houses, 8.

No. of animals killed per annum, about 1500.

Architect and engineer, George J. C. Broom, M.I.C.E

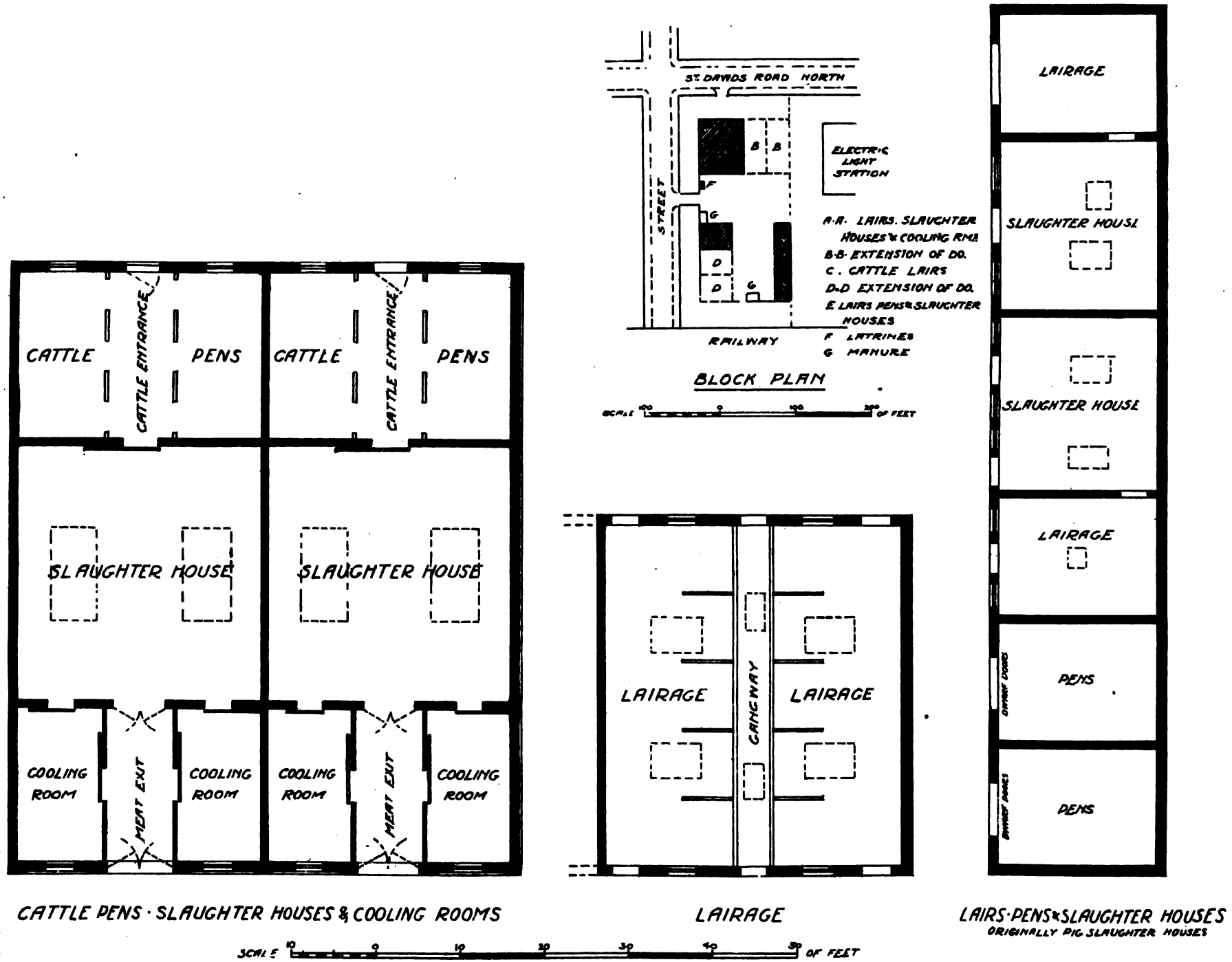


FIG. 12. ST ANNES-ON-SEA. BLOCK. PLAN. & PLANS OF LAIRS. SLAUGHTER HOUSES. COOLING ROOMS. ETC.

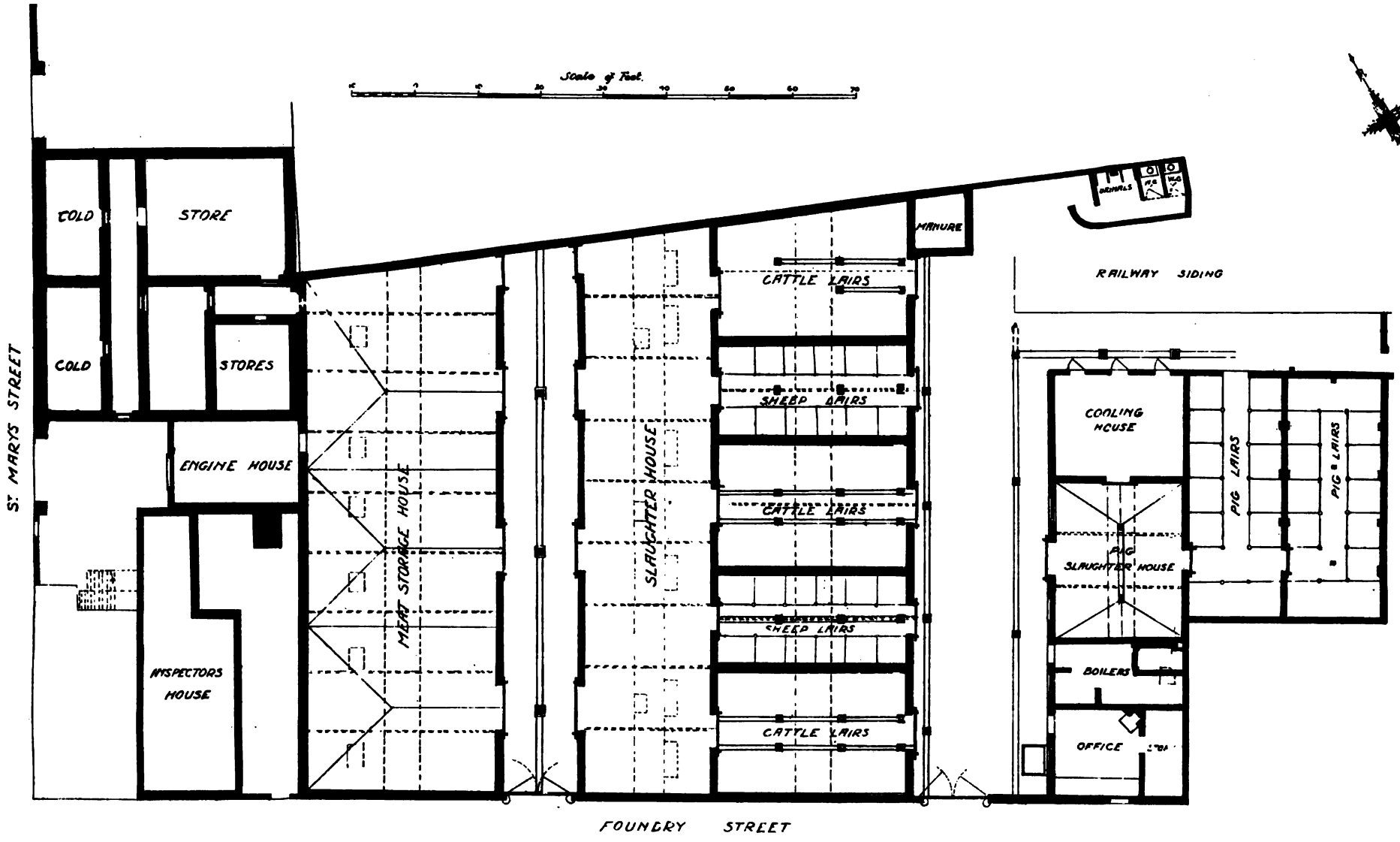


FIG. 13. St HELENS. LANCASIHRE. PLAN.

This scheme is a comparatively small one, but has the advantage of a railway siding for conveyance.

The three lairs for cattle are each about 30 feet by 20 feet, and the two for sheep about 20 feet by 14 feet. These adjoin the slaughter-house, 90 feet by 20 feet, which is planned on the "open hall" system. Between this and the cooling-house is a passage 12 feet wide. The cooling-house is about 84 feet by 30 feet. Large pig-styes are provided (together 36 feet by 35 feet) and adjoining them the pig slaughter-house (25 feet by 20 feet), cooling-house (20 feet by 16 feet), and boiler-house (20 feet by 10 feet.)

Large cold stores are placed near the cooling-house with engine-house attached.

A house for the inspector, office, store, and sanitary conveniences, complete the scheme.

CHAPTER IX.

ABATTOIRS CONNECTED WITH CATTLE OR MEAT MARKETS.

In this chapter a few typical examples will be given.

In large cities such an arrangement has been found to work admirably, and the dues derived from the market greatly add to the revenue of the combined undertakings.

Birmingham. (Fig. 14.)

Population, 522,182.
Date of erection, 1895–7.
Cost, 126,990*l.* (including site, which cost about 40,000*l.*).
No. of private slaughter-houses, 131.
No. of animals killed per annum, 212,884.

The design for these buildings was selected in a limited competition among architects practising in the City of Birmingham, and carried out under the superintendence of the successful competitors, Messrs. Essex, Nichol and Goodman. The original design has, however, been considerably altered in execution. The buildings are placed near the centre of the city, and not in direct communication with any railway, so the animals have to be driven to the abattoirs in carts or on foot. The site is somewhat cramped, occupying only about 2½ acres, which necessitates the lairs being placed over the slaughter-houses and approached by inclined roads.

The slaughter-houses are arranged on the open hall system for the retail butchers, and on the separate system for the wholesale traders.

The dead-meat market occupies the central position of the site, and is a very fine hall, about 360 feet by 90 feet, divided into 72 stands for the sale of carcases, with an average area of about 450 feet super each, including the two longitudinal and three transverse roadways. The salesmen's offices are placed in the centre of the hall over the stands, and are approached by two staircases under which are the public scale offices.

On each side of the meat market are cart roads about 22 feet wide, covered

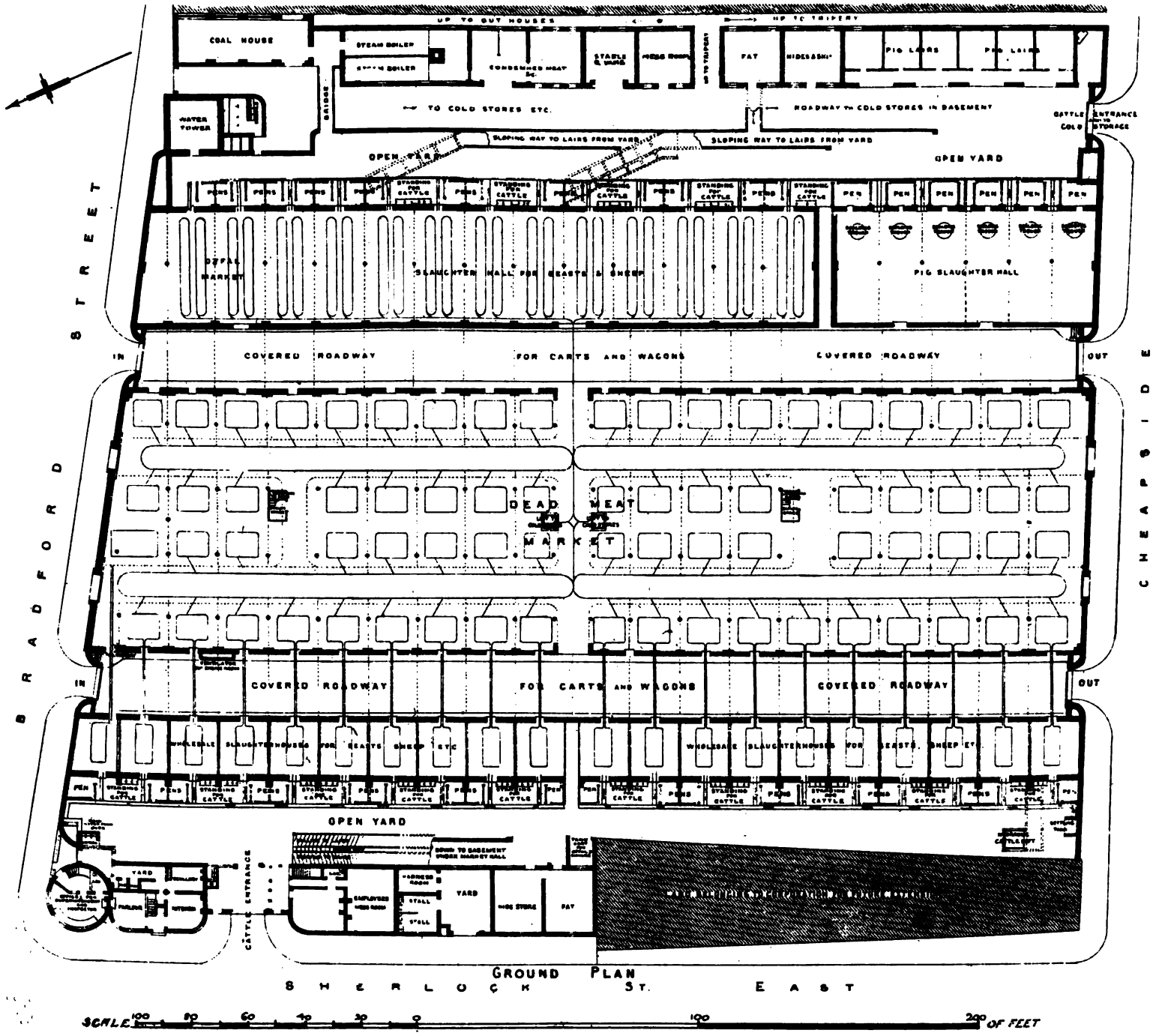


FIG. 14. BIRMINGHAM. PLAN.

with glazed roofs, for the conveyance of carcases from the markets, and also for the removal of offal, etc.

On the western side of the meat market (separated from it by the cart road) are 20 slaughter-houses for butchers slaughtering sheep and cattle for the wholesale trade. The whole range of slaughter-houses is covered on the upper floor with beast and sheep lairs, access to which is gained by an inclined road with a gangway for drovers in the centre. At the southern end of the lairs is a large hydraulic lift for the conveyance of restive or injured animals (unable to use the sloping way) to the slaughter-houses. These lairs are capable of stabling 200 beasts and 500 sheep. Each of the slaughter-houses has attached to it a lair for beasts and large pens for sheep, which are brought from the upper lairs and kept here before they are taken to the slaughter-house.

On the eastern side of the market (also separated from it by the covered roadway) is the large slaughter hall used by the retail dealers. A similar arrangement is here adopted as in the wholesale slaughter-houses. Pens and stables are provided for the animals brought from the upper lairs, in which they are kept whilst awaiting slaughter. At the northern end of the slaughter hall is a portion devoted to the sale of offal. The slaughter hall is entirely covered on the first floor by lairs, approached by two sloping roads from the open yard. There is accommodation for about 500 beasts and 1000 sheep. Styes for 200 pigs are placed at the south-eastern corner of the site. The pig slaughter hall (about 95 feet by 40 feet) is a continuation of the slaughter hall for beasts and sheep, and is arranged with 6 scalding troughs, at each of which two men would be enabled to work. Space is, however, provided for double this number if found necessary. Six pens are provided to accommodate animals brought from the styes and immediately awaiting slaughter.

The tripery is arranged over the pig-styes, and approached from the yard by a sloping way. It is connected also with the yard opposite by two bridges.

At the north-eastern corner is a large coal store and boiler house, the latter being fitted with two Lancashire boilers. Next to the boiler house are cooling rooms for seized and condemned meat with a small slaughter-house attached, and lairs for suspected animals adjoining. In this range of buildings accommodation is provided for men's mess-room, and fat, hide and skin stores.

At the north-eastern corner a large water tower is erected capable of holding 45 tons of water, and allowing a reserve supply sufficient for one day. Five rain-water tanks are provided in various positions which are useful in stopping any rush of storm water, and also for the necessary flushing purposes.

Offices for the superintendent, inspector, caretaker's residence, employés'

mess room, stables, fat and hide stores, etc., are placed adjoining the entrance from Sherlock Street East.

The basement is almost entirely devoted to cold stores and chill rooms, which are reached by sloping roads and also by two lifts for carcases in the centre of the dead-meat market. Cold stores and chill rooms have been provided, which are of sufficient size to accommodate 25,000 carcases of sheep and 300 sides of beef.

Special attention has been paid to the drainage, as owing to the shallowness of the sewers in the neighbourhood pumping is necessary from the basement. From the concrete floors of the lairs the drainage runs into open iron troughs running along the outside walls. From these it descends by iron shoots into open iron channels in the pavement of the yard. The swillings from the slaughter-house flow directly into the open gutters and so into the channels outside. A catchpit is provided by the boundary wall, having three levels, at each of which is a mesh (varying in fineness) so that practically all solid matter is removed before the drainage enters the sewers. The solid matter is constantly removed by hand and conveyed away on a tramway trolley from the yards adjoining the slaughter-houses.

LEEDS. (Figs. 15, 16.)

Population, 428,953.
Date of erection, 1898–9.
Cost, 40,000*l.*
Name of Architect, Mr. Walter Hanstock.

The planning of this abattoir is in many respects similar in general principle to that at Birmingham. The lairs are placed on an upper floor owing to the small area of the site, which is less than ¾ of an acre in extent.

The lairs for beasts are arranged over the slaughter-houses, and those for sheep over a portion of tripery, gut and blood rooms. They are approached by a sloping roadway with a gangway for drovers at the side. Lairage accommodation is provided for 100 beasts and 120 sheep. The slaughter-house for beasts and sheep is on the open-hall system, and is about 150 feet long by 18 feet wide. A series of waiting lairs are arranged (each about 6 feet 6 inches by 9 feet 6 inches) outside the slaughter-house, in which animals are stabled immediately before they are killed.

In the rear of the slaughter-houses are the tripery, blood and gut rooms, in close connection with the north entrance. These are all fitted with the most up-to-date machinery and plant.

The dead-meat market (195 feet by 45 feet) is placed parallel with, and fronting New York street, and separated from the slaughter-houses by a covered cart road 18 feet 6 inches wide.

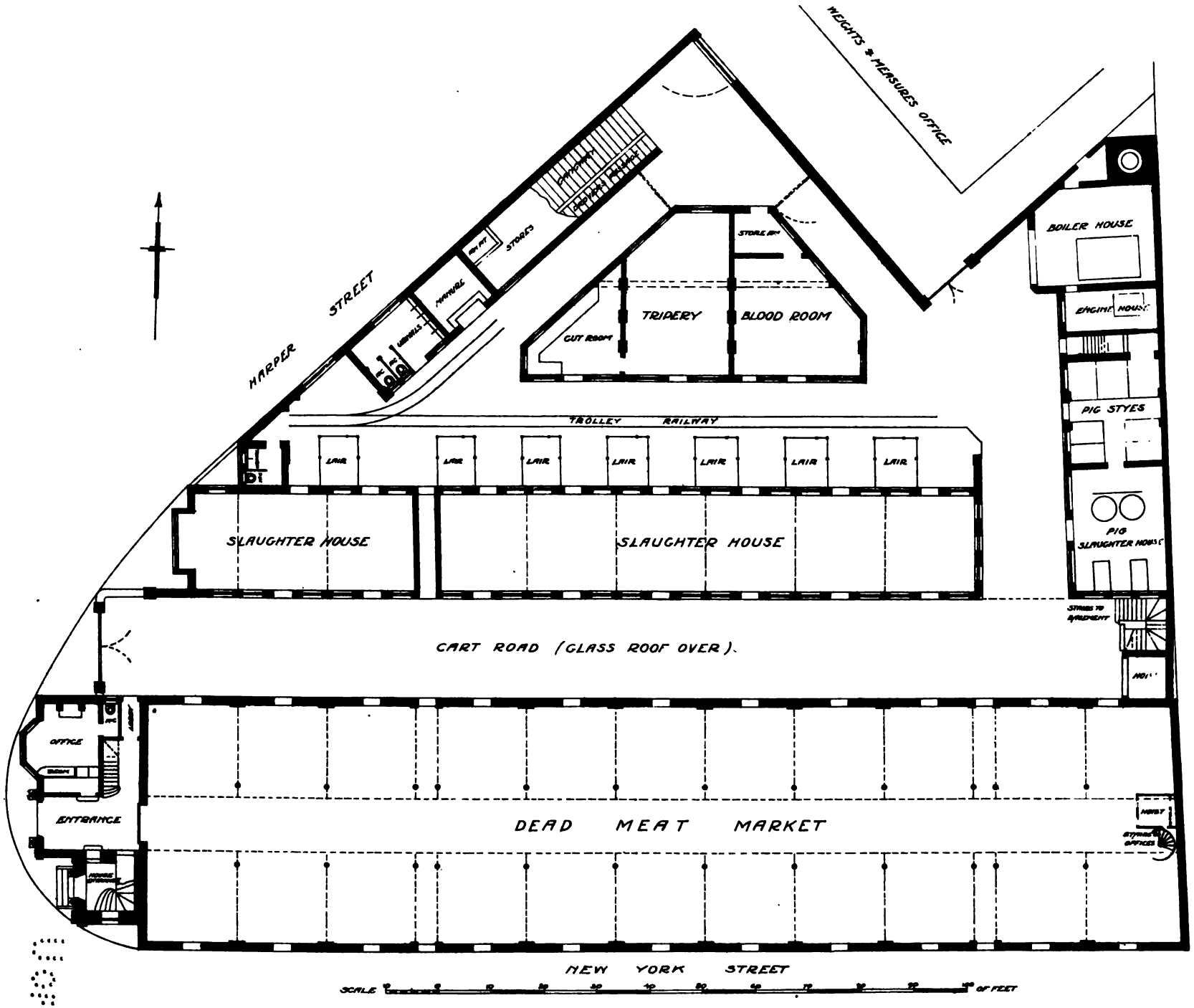


FIG. 15. LEEDS. GROUND FLOOR PLAN.

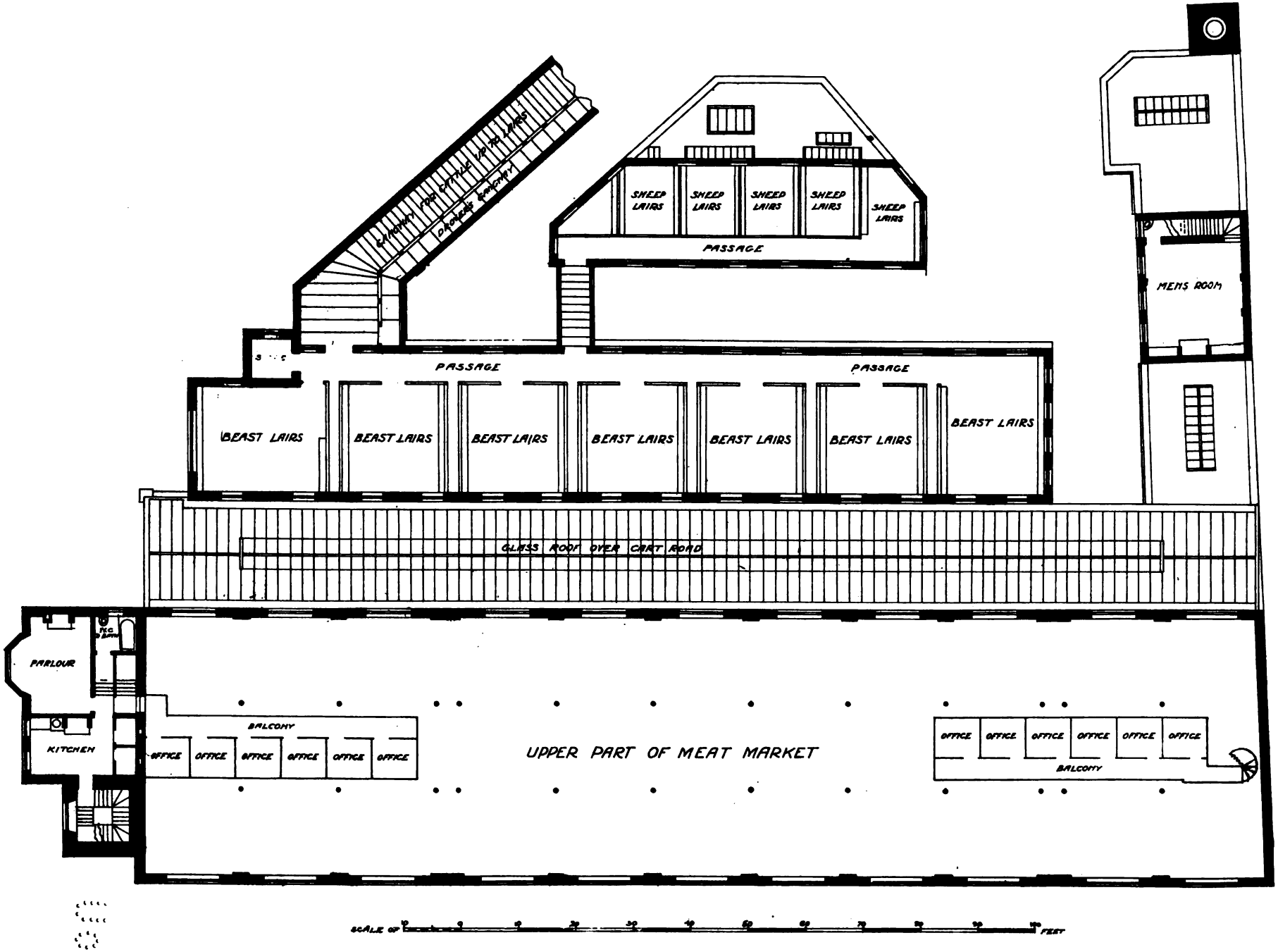


FIG. 16. LEEDS. FIRST FLOOR PLAN.

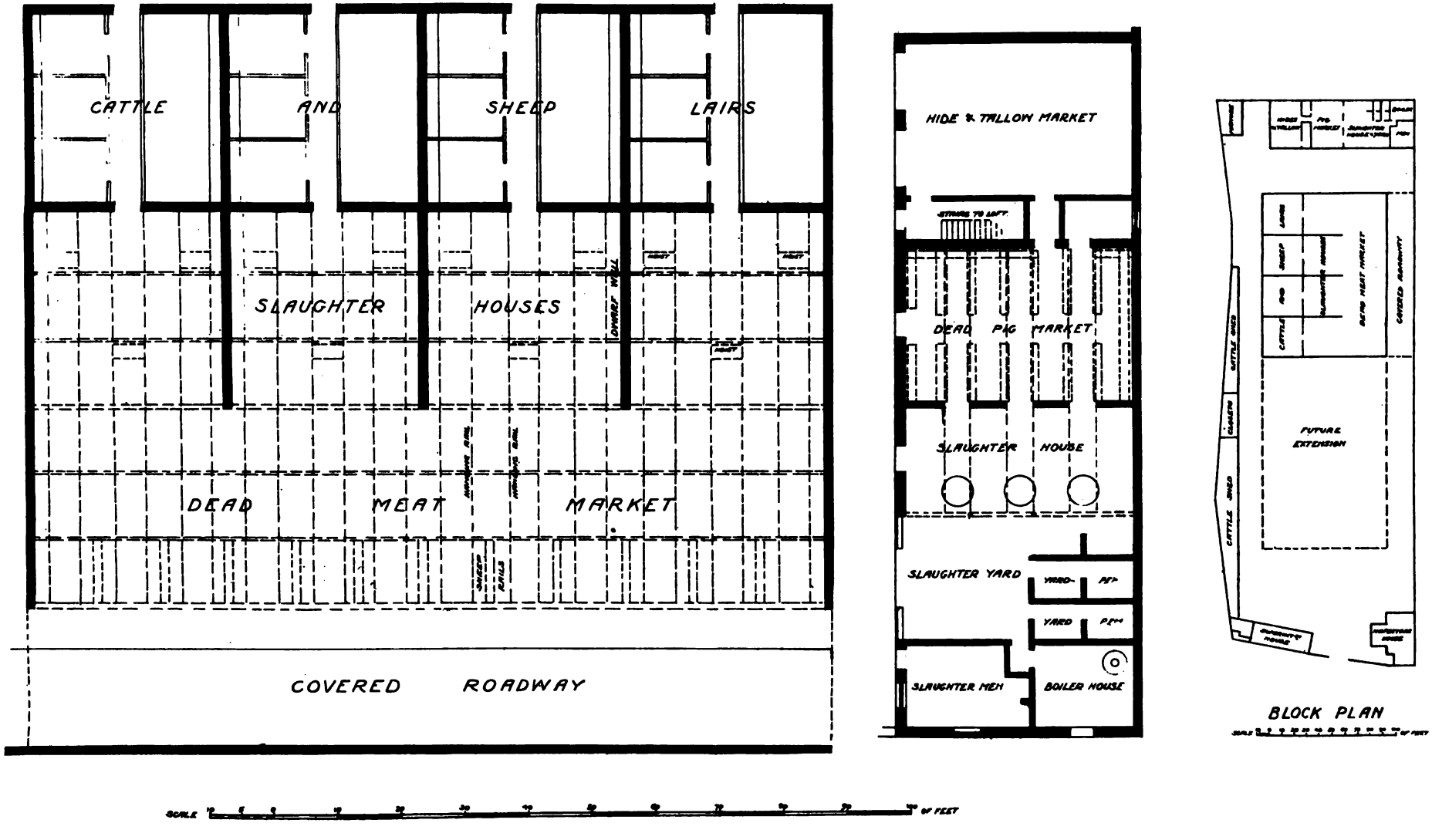


FIG. 17. HUDDERSFIELD. PLAN.

Twenty-two salesmen's stalls are provided, with accommodation for 1100 sides of beef, 1540 sheep, pigs or quarters. The main entrance to the market is at the corner of Harper and New York street, whence a roadway 10 feet wide runs the whole length of the hall. The offices for salesmen are twelve in number, aud placed over the centre of the dead-meat market. They are approached by staircases at either end, and each block of offices is connected by a passage or balcony.

At the north-east part of the site are the pig-styes, 19 feet 6 inches by 17 feet 6 inches, and, adjoining them, the pig slaughter-house, 23 feet 4 inches by 17 feet 3 inches.

On the north side of the styes are the engine and boiler houses, and a large room used as a men's mess-room is arranged over the styes.

The administrative block is placed at the western end of the meat market, with offices, etc., on the ground floor, and caretaker's residence on the upper floors.

Ample accommodation is allowed for cold storage under the entire area of the meat market, and is 15 feet 4 inches in height, to contain cold stores and chill rooms. The access is by means of spacious staircases, while hydraulic lifts are provided in addition from the ground floor to the basement.

With the exception of the rain water, no drains are covered. As regards the lairs, specially dished floors convey the drainage to the cast iron gutter fixed on the external walls, and is conveyed down the face of the wall to the ground floor level to channels in concrete.

The slaughter-house floors have a series of channels by which the drainage is conveyed to an outside channel the full length of the slaughter-house building. This empties into a separating chamber where the solid matter is specially treated.

The walls generally are lined with glazed brickwork, and wherever possible woodwork has been avoided in the construction.

HUDDERSFIELD. (Fig. 17.)

Population, 95,008.

Date of erection, 1882.

Cost, 16,590*l.*

No. of private slaughter-houses, 15 in outer district.

No. of animals killed per annum, 27,600.

Name of Architect, the late Mr. Edward Hughes, F.R.I.B.A.

These abattoirs are combined with the meat market.

The buildings are erected on a site of about 1½ acres, having ample room for extension. The cattle and sheep lairs are arranged adjoining the slaughter-

house, which is sub-divided by three dwarf walls. The carcases are taken direct into the dead-meat market on a series of hanging rails. A separate building is used as a pig slaughter-house, pork market and boiler house. Men's mess-room, tallow and hide market, superintendent's and inspector's residences, cattle sheds, and the usual sanitary conveniences are also provided.

GLASGOW. (Fig. 18.) FOREIGN ANIMALS WHARF, MERKLANDS, GLASGOW.

Population, 760,468.
Date of erection, 1906–7.
Cost, 75,000*l.* for buildings (exclusive of site).
No. of private slaughter-houses, none.
Name of Engineer, Mr. A. B. McDonald, M.I.C.E.

This is one of the most recently erected and best planned abattoirs, for slaughtering foreign cattle imported into the United Kingdom.

The site covers an area of about 8 acres, and is most conveniently situated for animals arriving by water. No pigs are killed at these buildings. A large open landing court is arranged on the south part of the site bounded by the quay wall. The animals are taken from the disembarking stage to their lairs, two for cattle (size about 355 feet by 360 feet and 240 feet by 90 feet), and another for sheep (about 130 feet by 90 feet).

The slaughter courts and cooling rooms for beasts are large, well ventilated, top-lighted halls, each about 325 feet by 105 feet. Temporary waiting lairs are provided for animals just about to be slaughtered, with passages for cattle behind, and also additional safety and manure passages adjoining.

A separate hall is erected adjoining the sheep lairs for slaughtering these animals, and cooling carcases. It is about 135 feet by 70 feet, and at the entrance to the killing portion a series of waiting pens are provided.

Dividing the two cooling rooms a series of buildings are arranged used as blood rooms, offal rooms, searching rooms, hides, chill rooms, etc.

On the eastern side (abutting on Sawmill Road), are the destructor, boiler house, chill room machinery, workshop, bothy, and sanitary conveniences.

On the northern side (facing South Street) are large hay stores, refreshment rooms, stables, manager's house, offices, etc.

Abattoirs for slaughtering imported cattle exist at other places in the Kingdom, but the above is described and illustrated as the most modern, and I think the best, example.

The number of animals slaughtered in the old abattoirs was about 46,000 per annum.

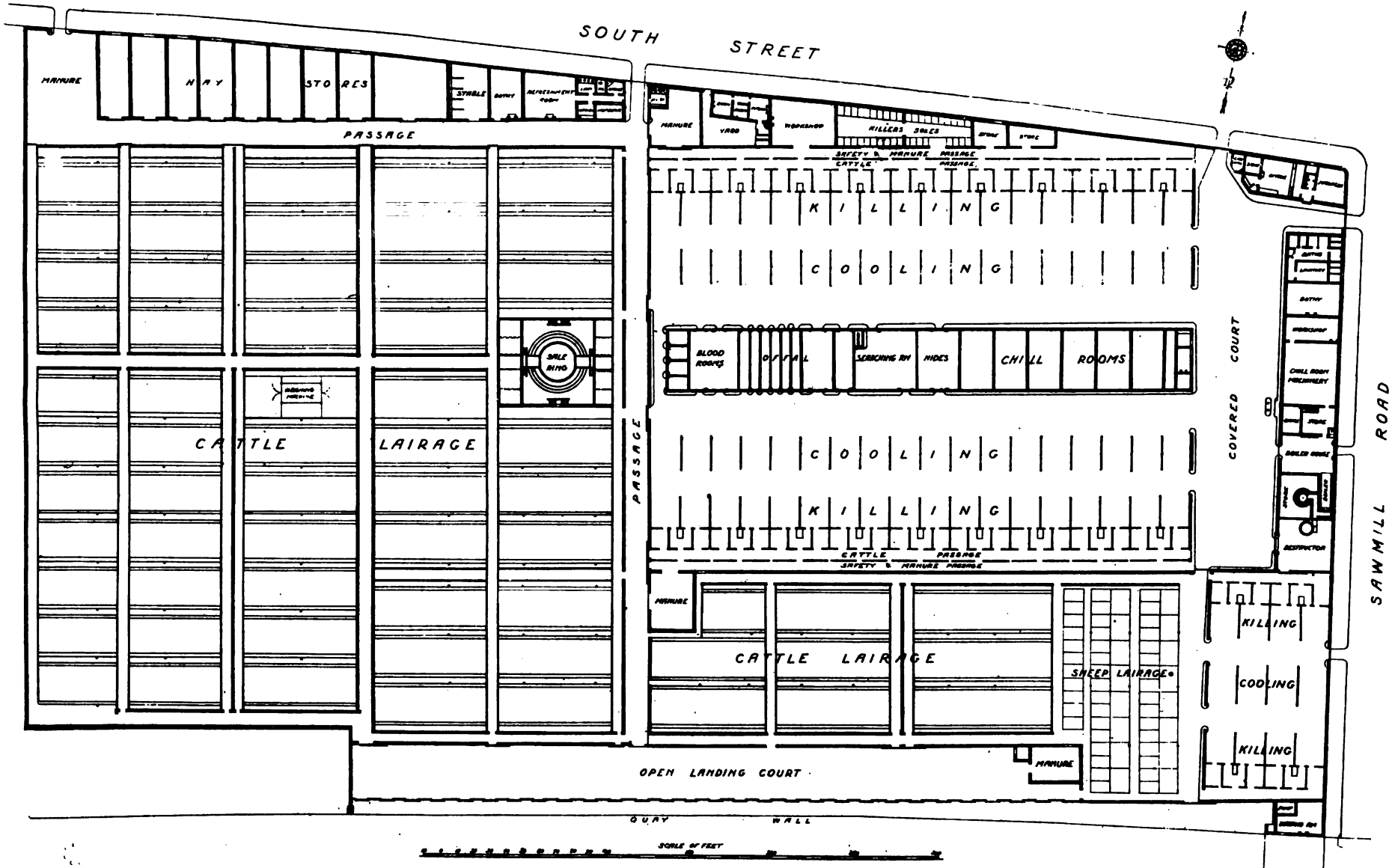


FIG. 18. GLASGOW. MERKLANDS. PLAN.

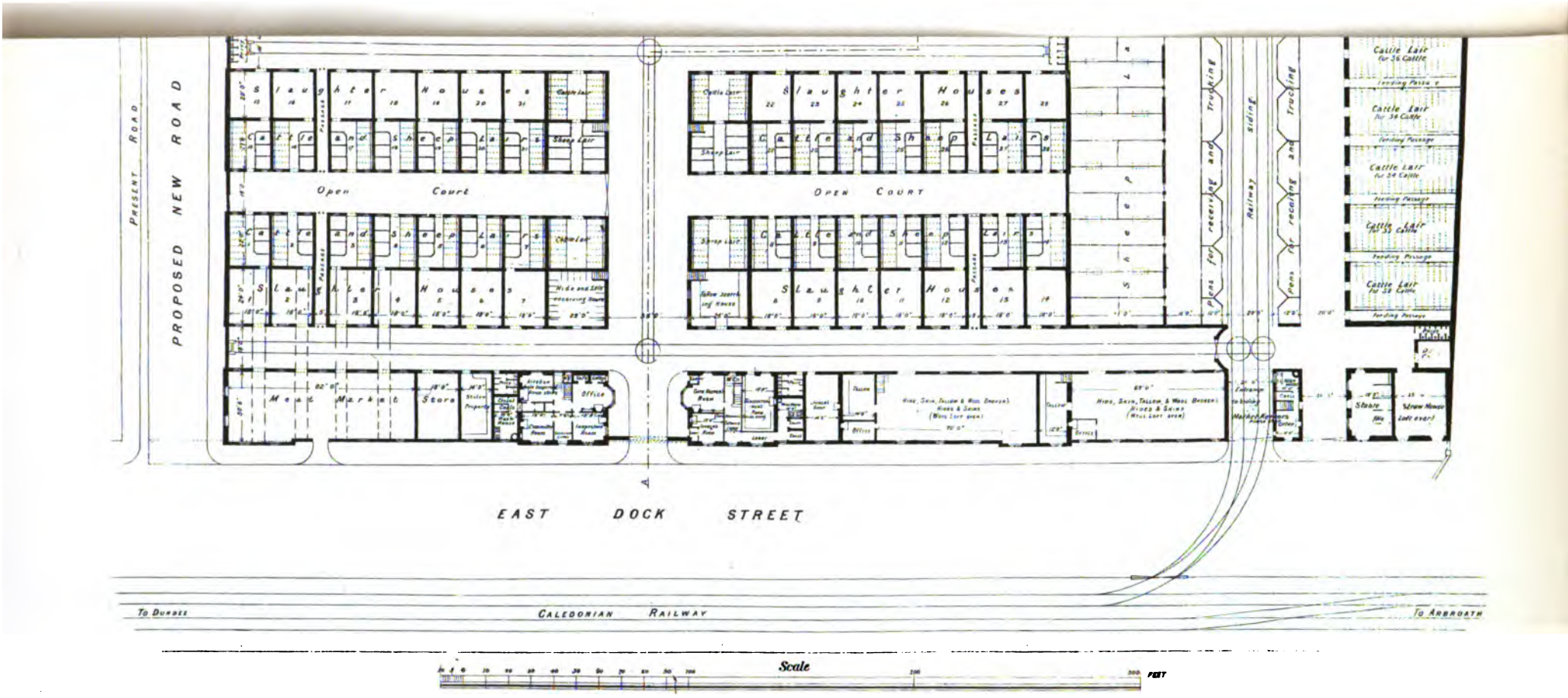


FIG. 19. DUNDEE. CAROLINA PORT. PROPOSED PLAN.

FIG. 19. DUNDEE. CAROLINA PORT. PROPOSED PLAN.

DUNDEE. (Fig. 20.)

These buildings were designed by the late Mr. William Mackison, F.R.I.B.A. in 1872, but the scheme has not been carried out in its entirety. It is, however, exceedingly interesting, and in a letter I received from Mr. Mackison in 1898 he states: "Since 1872 considerable change of method has taken place. The present markets and abattoirs in Dundee have not been built in accordance with these plans, but although differently arranged, the essential features are maintained." Plans of the buildings as existing are unfortunately not available, as they are now lodged in the Court of Session as documents in a law suit which the Town Council is defending.

How fully Mr. Mackison recognised the necessity for an ample site is shown in the following extract from his report to the Council.

"Nothing in fact struck me more on my recent tour of inspection, than the quantity of open space required, where cattle and sheep are being moved about by many individuals, in different directions, to various places within a market; as well as within the enclosures of an abattoir, where they are generally in a somewhat startled condition. The cattle brought to such markets are not all alike docile, very many of them have never been tied up at all, but have been running wild in the fields or on the mountain side; and without ample space, confusion will arise, the animals get injured, people's lives be endangered, and consequently, the prosperity of the market hindered, if not seriously destroyed." "It is not enough to provide for present wants. A site cannot be enlarged every day. And in providing new abattoirs and cattle market for this rapidly increasing town, the growth of the cattle and dead-meat trades must be taken into full account, in order to provide for the future requirements of the town."

Mr. Mackison was evidently not in favour of the "open hall" system, as, in referring to an abattoir which he visited in England, he says: "In this long slaughter-house, animals were to be seen at one glance, in all the stages of killing and preparation for the market. No doubt such a killing house, having no divisions, would be of economical construction, but there is something so revolting in the look of it as to forbid its being imitated." Were he, however, with us to-day, I have no doubt he would greatly approve of the arrangement at Chatham, where the slaughter hall is practically "open," but without the disadvantages which he mentions. The site is about 6 acres in area, and is bounded by the Caledonian Railway on the southern side, with sidings into the abattoirs, from which additional lines are arranged along wide avenues, practically connecting the whole of the lairs and slaughter-houses. Turn-tables are provided at the junctions where they intersect.

Owing to the site varying in level (about 40 feet from front to back) the buildings have been arranged in conformity with these conditions, and access gained to the various departments by sloping roads for men and animals, and wide staircases for foot passengers only.

I believe the plan will be self-explanatory, but the following notes may be useful to describe the scheme as designed.

"The hotel, which is situated at the north-west corner of the market, is entered off the Ferry road by a gate in the iron railings, and will consist of three storeys, on account of the steepness of the ground and the low level of the market area. In connection with this hotel, and extending southwards along the new road, is a wing containing tap-rooms, on the market level, with small court in front, and with bedrooms over these for the accommodation of drovers and others in charge of cattle and sheep. And in further connection southwards there is stabling accommodation for 20 horses, entered off the new street."

"In the centre of the railings, fronting Broughty Ferry road, there are three gates, separated only by two pillars. The west gate is intended as the entrance to the cattle and calf market stances, and by it cattle, calves and horses will be admitted, and from this gate a road 25 feet in width, separated from the iron railing by a retaining wall and sloping bank of about 11 feet in width, intended for shrubs, and to improve the appearance from the Ferry Road; this sloping bank could, at the option of the commissioners, be thrown into the market area, by bringing the entrance roads close up to the boundary wall at the Ferry road. If this were done it would increase the width of the market by 11 feet. This entrance road falls towards the hotel with an inclination of 1 in $14\frac{1}{2}$, and enters the market at the north-west corner. The centre gate is intended for foot passengers, and opens upon a stair 8 feet in width, leading right down to the centre avenue of the market, which separates between the bullock rails and enclosures and the sheep pens. Over the foot of this stair an arch is thrown, in the line of the south retaining walls, in which will be left a proper arched opening for fixing the market bell. The east gate is intended as the entrance to the sheep and pig market stances, and by it sheep and pigs will be admitted. From this gate a similar road to that already described from the west gate, will run in the opposite direction and enter the market at the north-east corner.

At the junction of these roads with the market, gates with wicket gates are placed, so that the keeper of the market can enclose between these and the street gates a drove of cattle on the one side, or of sheep on the other, until he has properly counted them for charging the market dues. This arrangement, I anticipate, will be of great service, as in many markets the bare statement of the drover has to be taken.

From the entrance roads just described, two roadways, each 25 feet in width, run along the west and east boundaries of the market, and are connected by a cross road 18 feet in width, through the centre of the market. Off these roads access is obtained by other roads of less width to the rail enclosures for tied-up bullocks; to the enclosure for loose bullocks; to the stances for calves; to the sheep pens; to the stances for pigs; to the enclosures in connection with the auction marts; to the drinking troughs; and to the roadways, 20 feet in width, leading from the south end of the centre avenue by the south side of the cattle market, westward by the south end of the hotel stables to the new road, with an inclination of 1 in 21, for the admission of cattle and sheep from the Newport ferry boat, and eastwards to the cattle and sheep lairs, railway siding and abattoirs, with an inclination of 1 in 14½. Two auction marts are shown on the plan, placed against the south wall, the one in the centre of the cattle market, and the other in the centre of the sheep market. These are each shown as being fitted up with an enclosed platform for the auctioneer and his clerk, and having a small fireplace for winter use. In the front of each platform there is an enclosed area, 22 feet by 20 feet, with octagon sides next to the public gallery. The gallery has three stages for the accommodation and convenience of buyers. The area has a door on each side of the auctioneer's platform, connected with two large covered areas, the one for holding cattle or sheep to be sold, and the other when sold, and until the set time for removing them from the market. The marts are each surmounted by an octagon roof, with centre lantern, fitted with louvre boarding for securing proper ventilation. On the west side of the market and in front of the hotel wing, are the superintendent's office and four banking offices, and at the south-east and south-west corners, urinal and water-closet accommodation is provided for the public. Similar conveniences are also provided in the courts of the hotel wing and stables.

"The entrance to the abattoirs is from East Dock Street, under an archway. On the west side of the gate, and facing Dock Street, is the superintendent's dwelling house; office with committee room; small outhouse in connection therewith; water closet and urinal accommodation in connection with the adjoining section of killing-houses; room for stolen property; storeroom; and dead-meat market extending to the west boundary. This market is intended for the sale of dead meat to those who do not kill for themselves, and for hanging up carcases not removed in time from the public killing-houses. On the east side of the entrance gate, and also facing Dock Street, are the gatekeeper's house day room, jobbers' waiting room, slaughtermen's waiting room, outhouses, urinals and water-closet accommodation, joiners' workshop, and two sale rooms, each containing separate places for hides, skins, tallow, and office, and having a loft over

it for wool store. From the entrance gateway there is a road, 35 feet in width, leading right up the centre of the abattoirs. On each side of this central roadway there are three rows of slaughter-houses, with byres attached, and separated from each other by cross roads 18 feet in width. There are thus six sections of slaughter-houses, each containing seven killing-rooms. At the end of these groups, next the centre roadway, there are a tallow searching house, hide-receiving and weighing house, six lairs for cattle and sheep, with six small lofts above for storing hay. There are in all forty-two killing-houses, exclusive of killing-house for diseased cattle, and pig and sheep slaughter-houses. The front row of killing-houses measure each 24 feet by 18 feet, with byre 18 feet by 22 feet; the second and third rows, each 22 feet by 18 feet, with byre 20 feet by 18 feet. The first row faces the first cross road, the second row the third cross road, at both ends of which are conveniences for the workmen. The byres attached to both roads front the second cross road, by which cattle are only taken to the byres, and which may be turned into cattle courts by shutting the gates next the centre roadway. The fourth, or northernmost cross road, gives access to the byres of the third row of killing-houses, and to the northernmost range of buildings extending along the north side of this roadway, and containing, from the west end eastwards, the condemned cattle byre, condemned slaughter-house, boiling-down house, condemned meat store, suspected cattle lair, boiler house, pig slaughter-house, pig lair, blood house, with drawing off and drying rooms over it, triperies, small stable, gig house, sheep-killing house, sheep lair, and covered dung stance, at east gateway. By this gateway there is direct and convenient communication with the railway siding, cattle, sheep, calf, and pig lairs, and the cattle market. The roadways will be paved in setts set on concrete, and the floors of the killing-houses and byres with Val de Travers asphalte, of sufficient thickness over concrete."

"On the east side of the abattoirs, and occupying the south-east section of the site, are the lairs, railway siding, and siding pens for discharging and trucking cattle and sheep. This section has a frontage to Dock Street, and also extends along the east boundary of the site. Two lines of rails are laid down on the plan, from the Caledonian Railway to the siding. On the west side of the siding are the sheep lairs, and on the east side the cattle lairs, each separated from the siding by the siding pens, and adjoining roadways. The sheep lairs are calculated to contain with ease 950 sheep and the cattle lairs 320 bullocks. The pig and calf lairs will store about 100 each. On the east side of the archway at Dock Street, under which the two lines of rails pass, is a small office for the lairman, with house over for the keeper of the market. To the east of this is a roadway leading to the lairs, and although by this roadway there is access

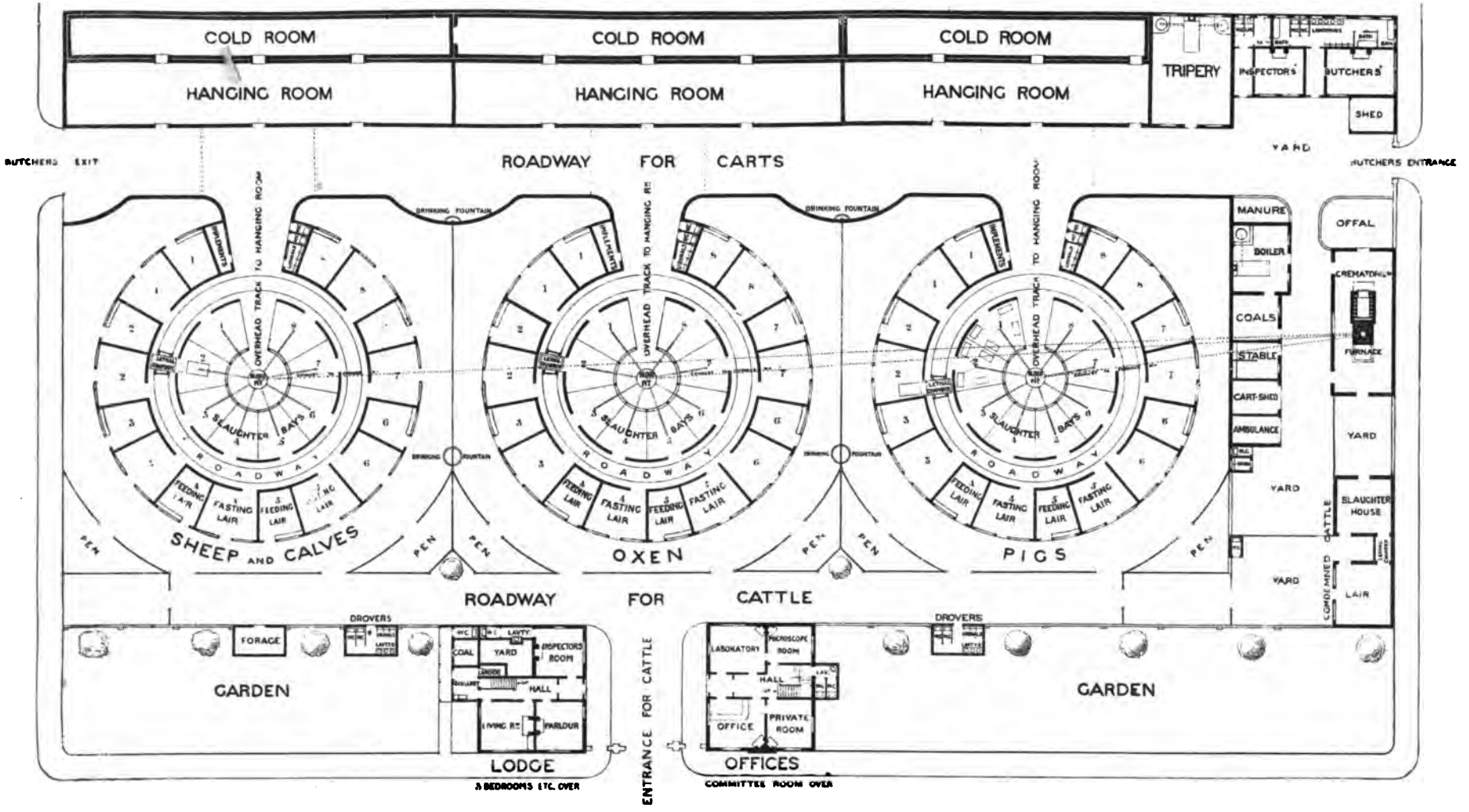


FIG. 20. PLAN BY MODEL ABATTOIR SOCIETY

to both the cattle market and abattoirs, it is not intended that this road should be used otherwise than for lair purposes; as neither is it intended that by the north-east gate to the abattoirs any animals will be admitted, other than those from the market, or which have been stored at the lairs. On the east side of the entrance to the lairs at Dock Street are a small stable for the drovers' horses, straw house, hay loft, small court with dung-pit, and the requisite urinal and water-closet accommodation. At the north end of the siding and in continuation of the northernmost row of the abattoir buildings, are pig lair, implement house, calf lair, drovers' waiting room, with hay-loft over the whole. The floors of the lairs will be laid with asphalte over concrete, with proper gradients to run off the water and to suit the standing of the cattle. The sheep lairs will be divided into sections of different sizes for the separation of the flocks of sheep therein stored, and will have iron hay hecks suspended in each section, and water-troughs placed between each pair of divisions.

Feeding passages are introduced between the cattle head-rails with hay hecks, and water-troughs fitted up at each head-rail and the sheep and cattle lairs will all be thoroughly lighted and ventilated from the roof and louvred windows. The lairs for pigs and calves are also sub-divided for convenience. The divisions in all the lairs will be made of wood, and the lairs will have gas introduced into them. The roadways at the lairs will be paved, but those on the south and north sides of the market will be macadamised over a foundation of concrete. In addition to the accommodation provided at the lairs, 165 bullocks can be tied up during the night in the covered shed in connection with the auction marts.

Mr. Mackison's contention that "with proper management and carefully framed by-laws for regulating the cattle-market, abattoirs, dues and charges to be levied thereat, the abattoirs will ultimately pay," has happily been fully justified.

Model Abattoir. (Fig. 20.)

Designed by Mr. Bertram Richardson, and drawn by Messrs. Unsworth and Newberry.

Fig. 20 shows a most interesting plan of an abattoir scheme suggested by the Model Abattoir Society some years ago.

The main idea that every animal should be rendered insensible by being placed in a lethal chamber before it reaches the slaughter court, undoubtedly appeals most strongly to the humanitarian, and would appeal in no lesser degree to the butchers if by such an arrangement the work of slaughtering becomes less

arduous, the expense of killing not increased, and the flesh of the animal not deteriorated.

Towards the latter part of his life, Sir Benjamin Ward Richardson experimented in some private slaughter-houses in the West End, and found that the tests were entirely successful. The animals suffered no pain, the flesh was quite uninjured and sold in the ordinary course of trade, whilst the butchers expressed satisfaction at the ease with which their work could be accomplished.

Such a scheme, however, applied to a large abattoir, has not yet been tried. The principle is a fine one, but whether it can be brought within the range of "practical politics" is somewhat debatable.

To the butcher, the question of cost of slaughtering is a very important one, and any suggestion of increasing this would lead to most strenuous opposition from the tradesmen. Again, within the last few years so many effective instruments have been invented for rendering animals insensible in the ordinary abattoir, that it is doubtful whether the additional space and expense required would be justified.

The plan is suggestive only, and not drawn to scale. This is obvious from the fact that the pavilions for sheep, beasts, and pigs, are here shown similar in size, and would not be applicable to general requirements without modifications.

As will be seen from the plan, the main buildings are circular, and consist of an outer ring of adjacent feeding and fasting lairs. Eight radiating slaughter bays are suggested, with a small central enclosure from which the veterinary inspector would have a full view of the whole of the bays.

Between the lairs and slaughter bays a lethal chamber would be arranged, travelling on tram lines, so that it could be easily taken to any particular lair as required. By this arrangement no living animal sees the carcases of the dead, and each is rendered insensible before it is taken into the place of slaughter. Overhead tracks connect the slaughter bays with the hanging and cooling rooms, by which means the carcases are conveyed, necessitating as little handling as possible.

A special feature of the scheme is that the portion of the abattoir for live animals is quite distinct, and shut off from that devoted to the carcases, whilst ample space is provided around the lairs for the animals to perambulate between the time of arrival and slaughter.

The subsidiary buildings are carefully considered and conveniently placed.

By this method of planning, although the slaughter bays are on the "open-hall" system, one of the strong "trade" objections can be removed. The whole scheme might be in the hands of the local authority, charging a tariff for each animal killed, or separate lairs and bays might be let to individual butchers, at an annual rental.

This is an obvious advantage over the separate system, from the fact that the veterinary inspector has full command over the whole of the slaughter bays, whilst standing in the centre enclosure.

The Cattle Markets and Abattoirs of La Villette, and the Abattoir of Vaugirard, Paris.

In France and in Germany as early as the thirteenth century, public slaughter-houses existed. They were erected by the various butchers' guilds, and were used jointly, for slaughtering animals and dressing carcases. Many of these buildings continued to be used until the early part of the nineteenth century, when a number of the old slaughter-houses having fallen into disuse, partly through apathy and partly owing to the almost non-existence of the guilds, a revulsion of feeling took place. Naturally, the evolution was a slow process, and although to-day the modern German abattoirs are the best in the world, the French nation may justly claim to be the pioneers in the establishment of such buildings on hygienic, humanitarian and comprehensive lines. In 1868, a law was passed in Germany strongly advocating the erection of public abattoirs, but it was not until 1881 when another act was passed, that any marked improvement took place. In France, however, as early as the sixteenth century, a law was passed to the effect that—

"The killing and skinning of all beasts should be outside the city (of Paris), and near the river." Notwithstanding the efforts of the civic authorities to carry this law into effect during the seventeenth and eighteenth centuries, the opposition of the butchers was so strong as to render the law practically futile. In 1810, however, another law was passed ordering the erection of five abattoirs in Paris, three on the left bank and two on the right bank, but they were nearly all eventually closed and superseded by the abattoirs at La Villette and Vaugirard (La Rive Gauche). About thirty years elapsed between the erection of these two abattoirs, and naturally the practical experience gained in this time enabled the architect of the latter buildings to institute many important improvements on the planning of La Villette. But even to-day these buildings are a monument of pioneer work, and a splendid sample of a grand and comprehensive scheme. The modern German abattoirs have been fully illustrated and described in recent works on the subject, so I propose to treat in the following chapter only with the two fine examples in Paris.

CHAPTER X.

THE CATTLE MARKETS AND ABATTOIRS OF LA VILLETTE AND VAUGIRARD, PARIS.

The Cattle Markets and Abattoirs of La Villette, Paris.

(Figs. 21 to 29.)

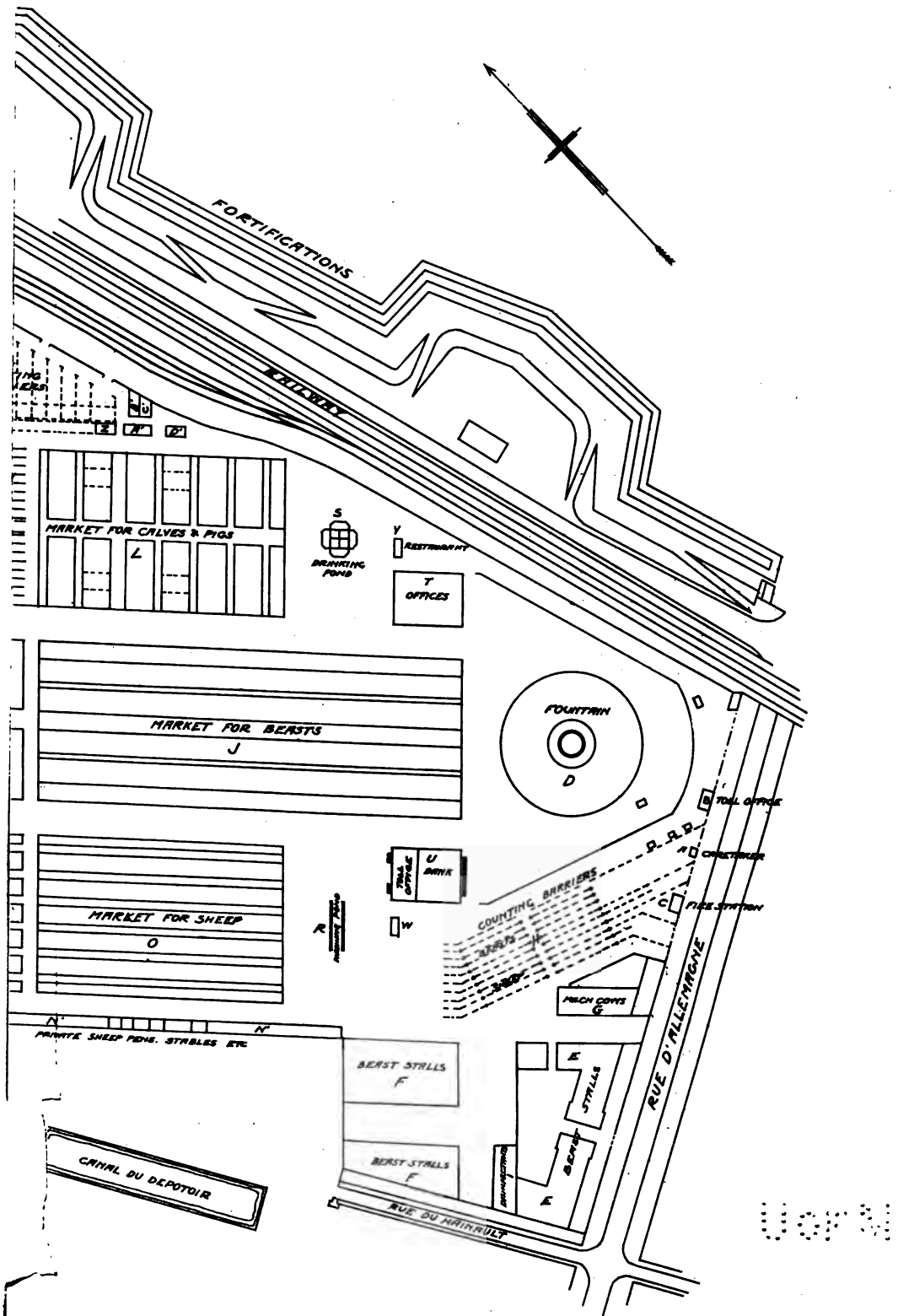
These buildings were erected from the designs and under the superintendence of M. Janvier, architect, and opened in 1867. At that time it was believed that the scheme was sufficiently large to meet the wants of the whole of Paris, but although additions were made from time to time, another abattoir was found to be necessary, viz., that of Vaugirard (La Rive Gauche), which is described and illustrated later.

The site is in the north-east part of Paris, within the fortifications, and bounded on the eastern side by the Chemin de Fer de Ceinture. The Canal de l'Ourcq divides the site into practically two equal parts, whilst the western side is bounded by the Canal St. Denis and the Canal du Depotoir. Fig. 30 shows a complete block plan of the buildings. It is difficult to over-estimate the enormous advantages of these means of transport. The necessity for driving cattle through the streets is obviated, which, in addition to being dangerous, deteriorates the flesh of animals when killed.

Some idea may be obtained of the magnitude of these buildings from the fact that the site is about two-thirds of a mile long, by one-third of a mile wide, and covers an area of about 105 acres.

The general arrangements for dealing with the works are as follows. Mondays and Thursdays are devoted to the selling of cattle. Tuesdays and Fridays to killing and dressing, and Wednesdays and Saturdays to carting, although each kind of work is carried on continually in some part of the abattoir.

The animals killed in these abattoirs practically provide the meat supply for three-quarters of the population of Paris, and in 1906 the numbers slain were 225,299 cattle, 235,216 calves, 1,779,375 sheep, and 258,934 pigs, in all, 2,498,824 animals.


FORTIFICATIONS
BOULEVARD
MARKET FOR CALVES & PIGS
L
S
DRINKING POND
V
RESTORATORY
T
OFFICES
MARKET FOR BEASTS
J
FOUNTAIN
D
TOLL OFFICE
R. R.D.
CHESTERLOO
FIRE STATION
TOLL OFFICE
U
BANK
COUNTING BARRIERS
MARKET FOR SHEEP
O
R
W
PRIVATE SHEEP PENS. STABLES ETC.
N
BEAST STALLS
F
BEAST STALLS
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CANAL DU DEPOTOIR
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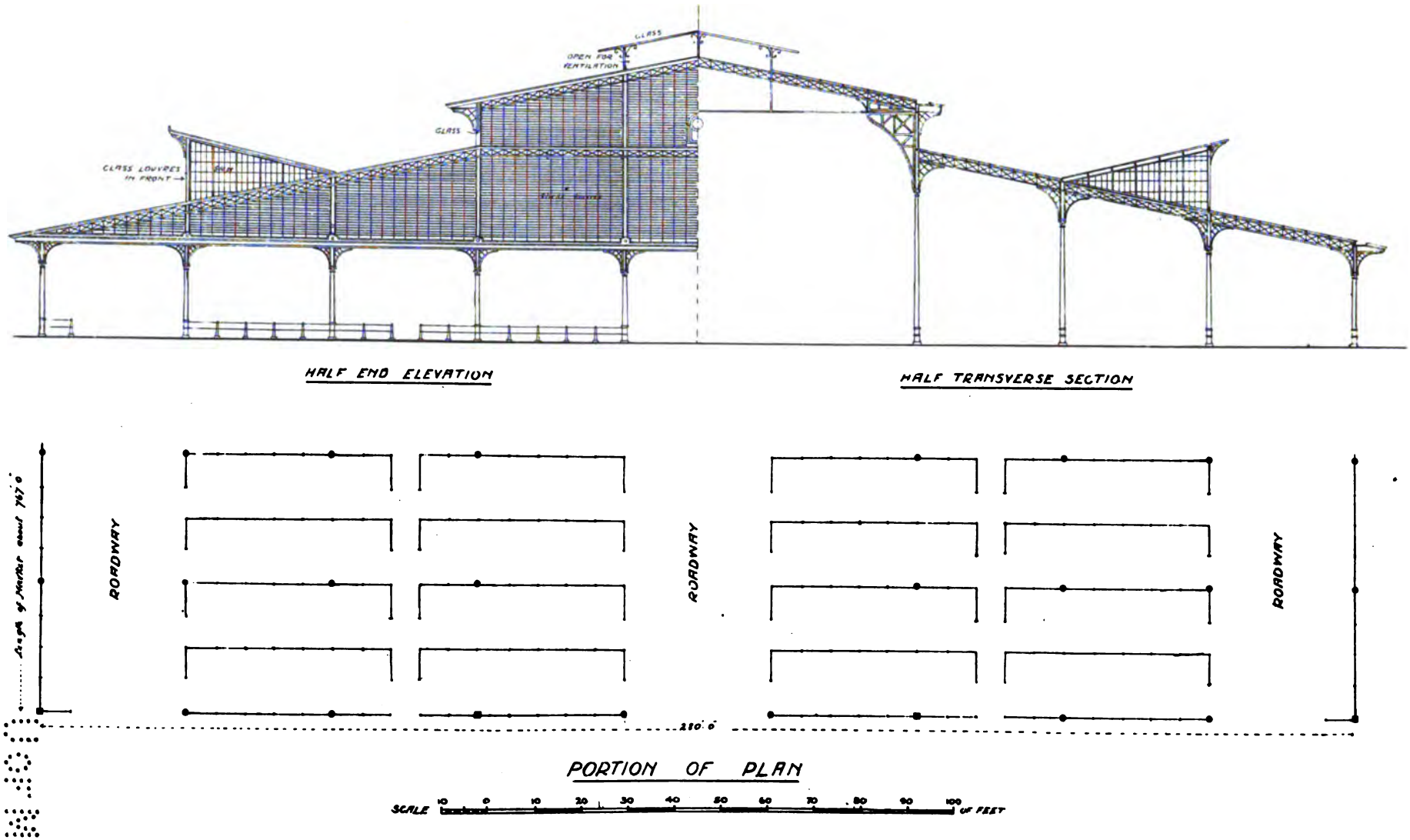

FIG. 22. LA VILLETTE. PARIS. PART PLAN. ELEVATION. & SECTION. OF LARGE CATTLE MARKET.

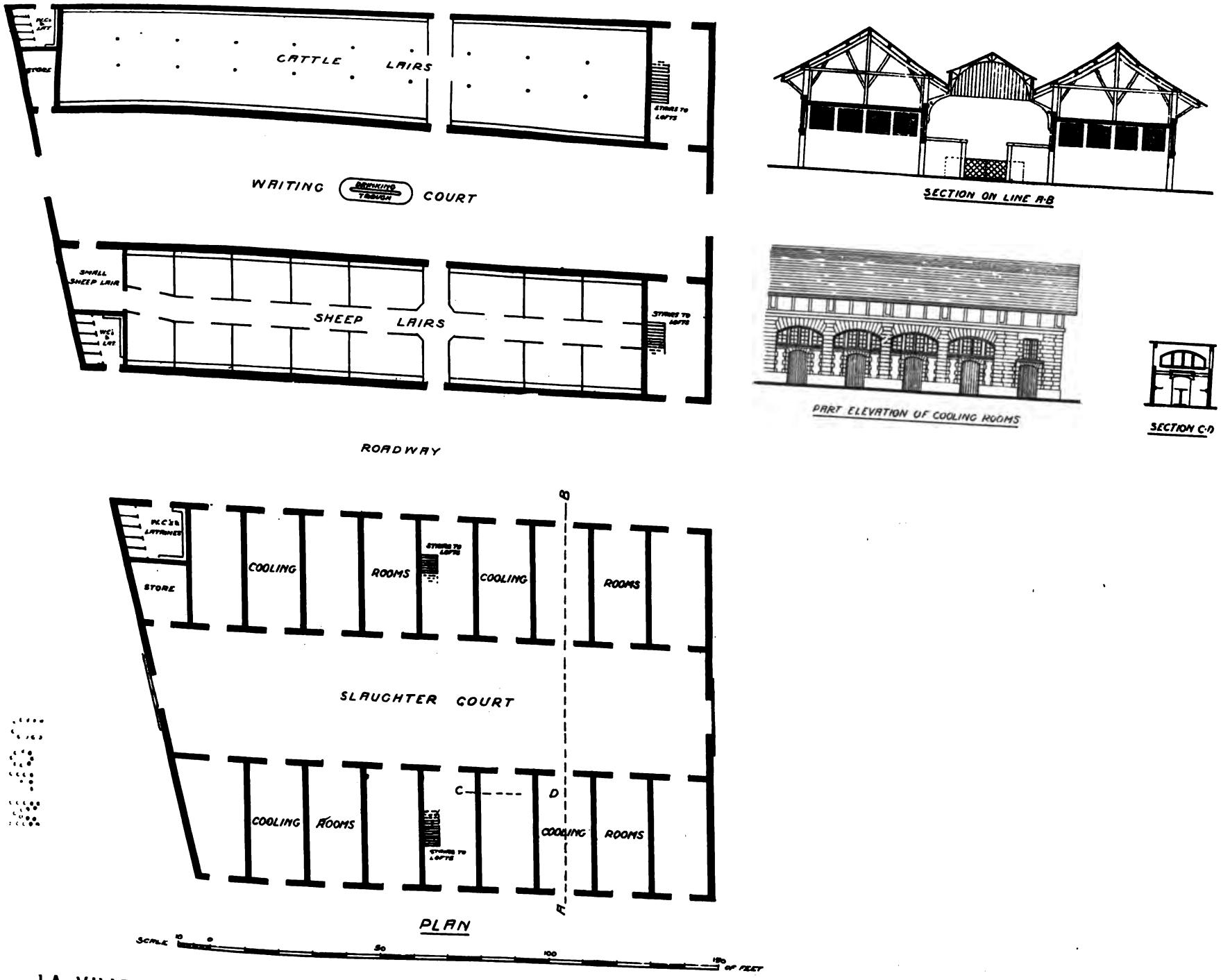

FIG. 23. LA VILLETTE. PARIS. PLAN. ELEVATION & SECTION OF SLAUGHTER COURT & COOLING ROOMS & PLAN OF LAIRS & WAITING COURT.

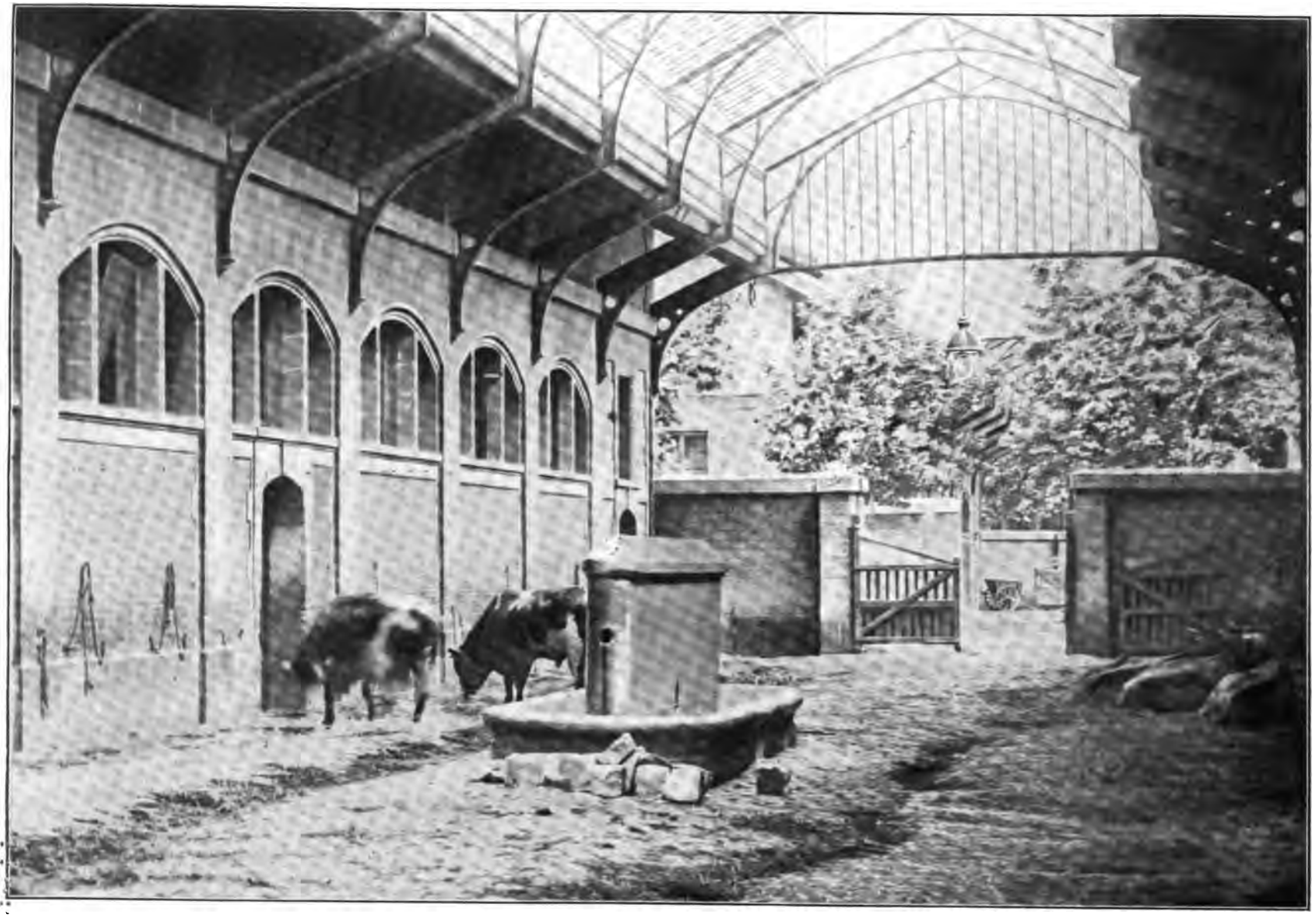

FIG. 24.—LA VILLETTE, PARIS. INTERIOR OF WAITING COURT.

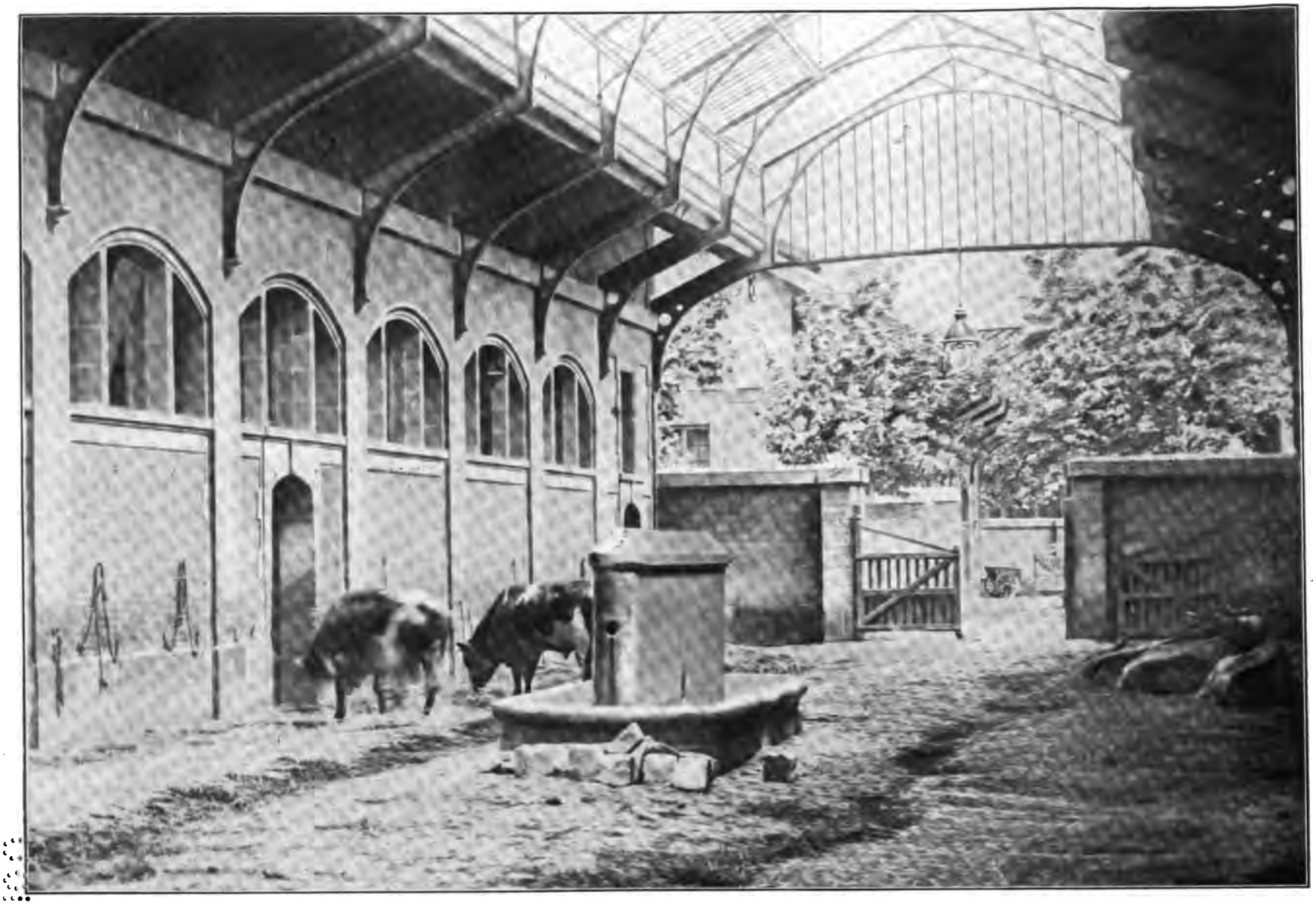

FIG. 24.—LA VILLETTE, PARIS. INTERIOR OF WAITING COURT.

FIG. 25.—LA VILLETTE, PARIS. INTERIOR OF SLAUGHTER COURT.

FIG. 25.—LA VILLETTE, PARIS. INTERIOR OF SLAUGHTER COURT.

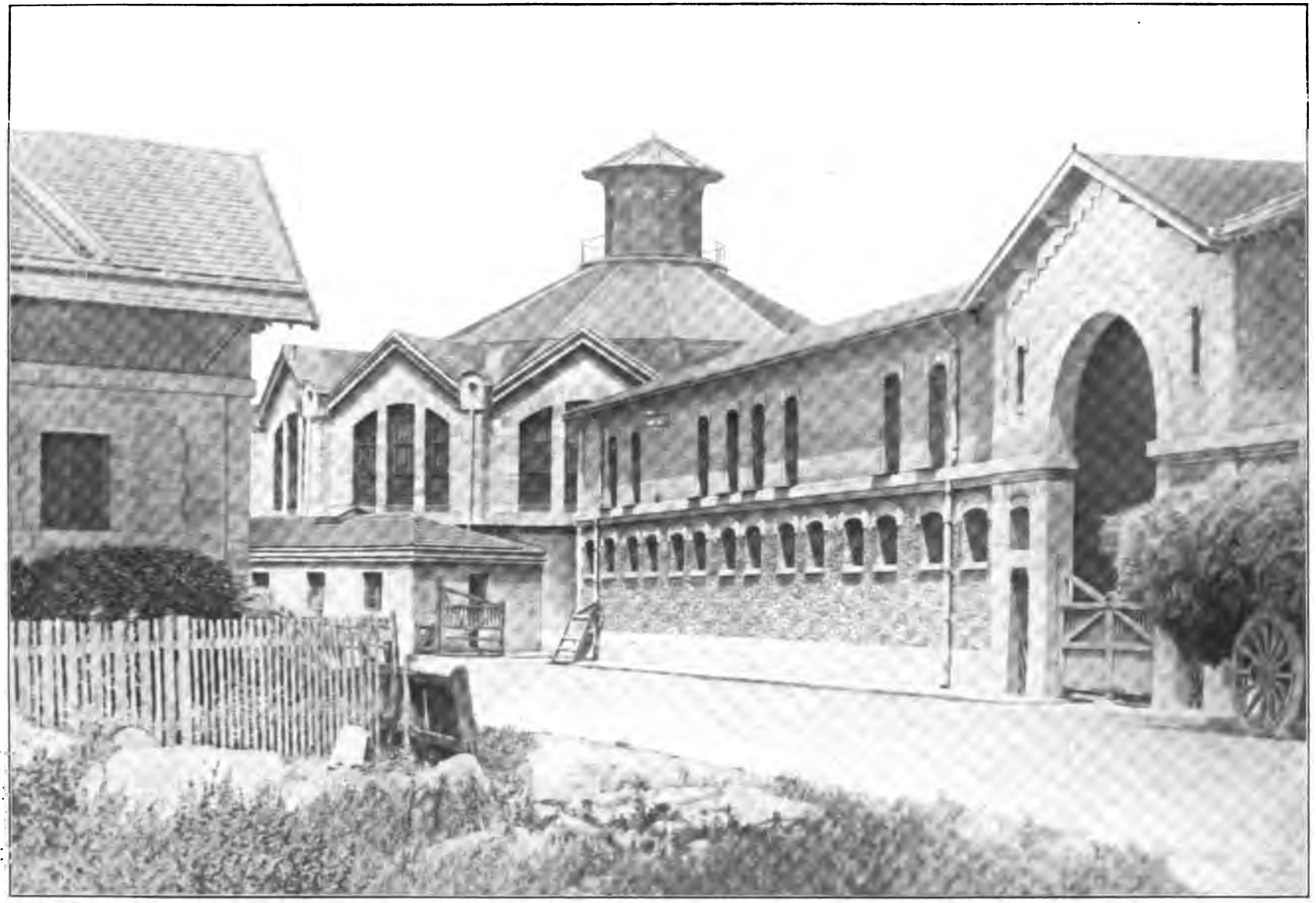

FIG. 26.—LA VILLETTE, PARIS. VIEW OF PIG STYES AND PIG SLAUGHTER HALL.

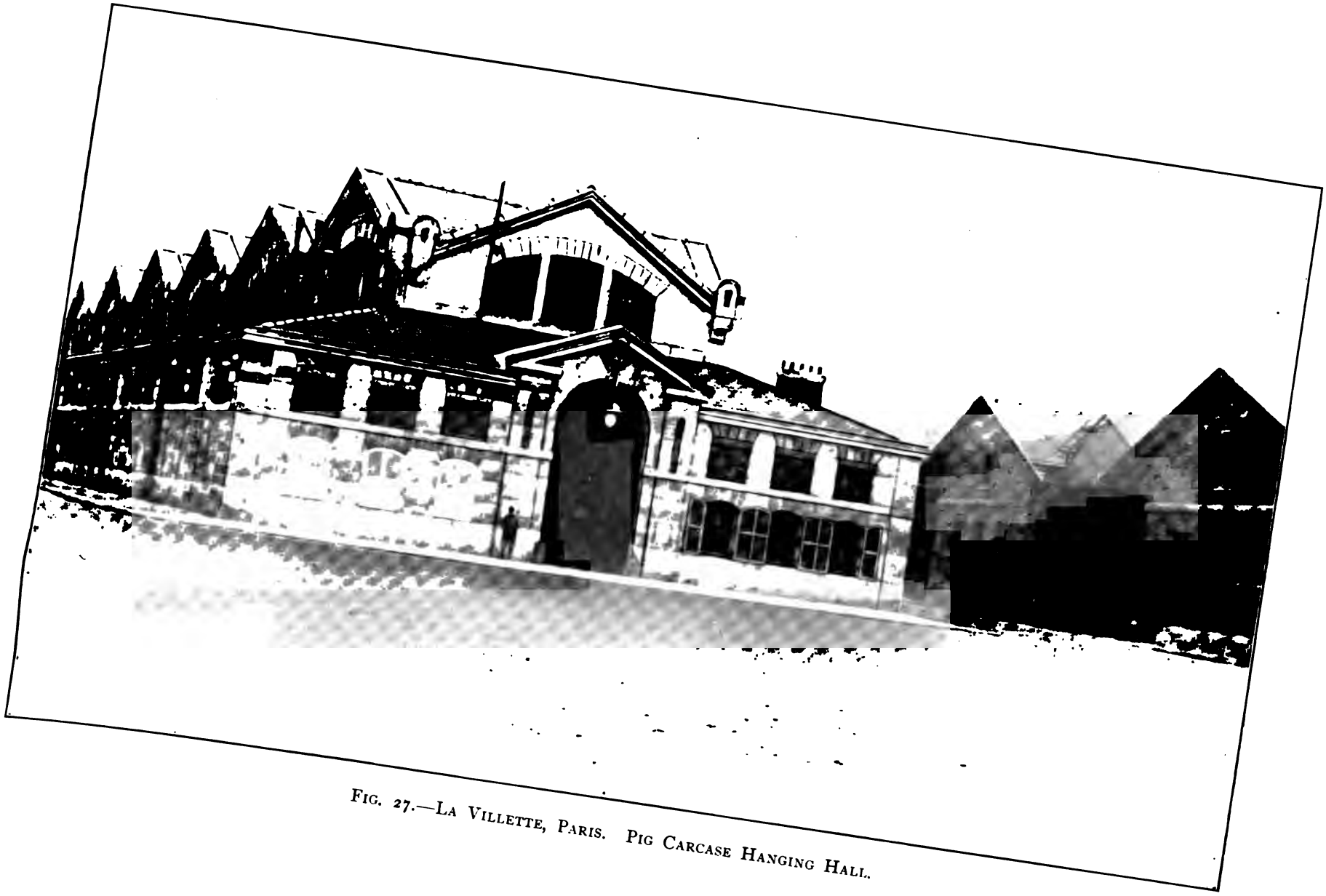

FIG. 27.—LA VILLETTE, PARIS. PIG CARCASE HANGING HALL.

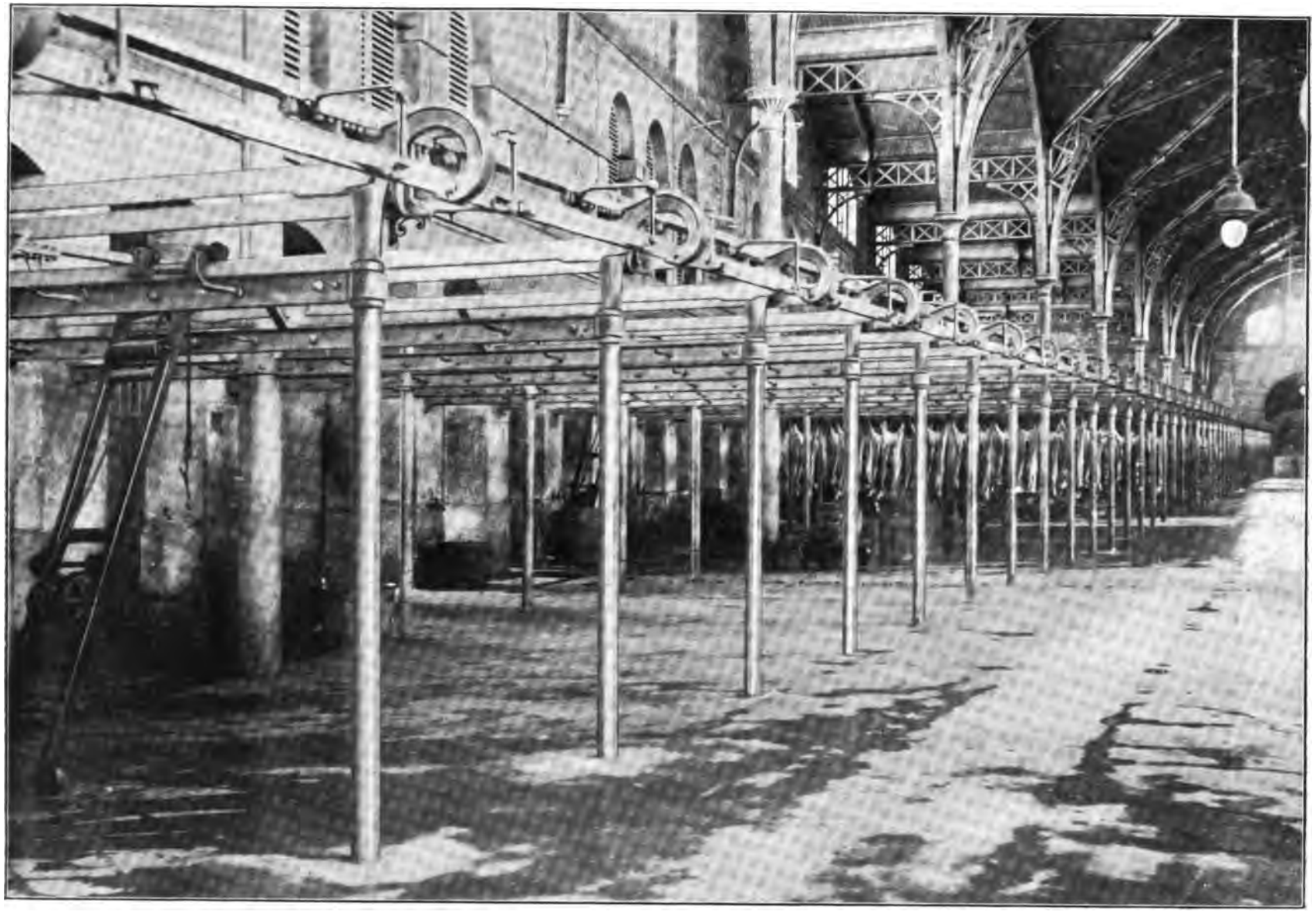

FIG. 28.—LA VILLETTE, PARIS. INTERIOR OF PIG CARCASE HANGING HALL.

FIG. 29.—LA VILLETTE, PARIS. VIEW OF CLOCK TOWER AND AUCTION MART.

The main entrance to the cattle markets is from the Rue d'Allemagne, adjoining which are three buildings (A) caretaker, (B) toll offices, (C) fire station.

Between the road and the large central cattle market is an immense courtyard, in which has been erected an old and beautiful fountain, which originally stood in the Place de Château d'Eau. It consists of three superimposed basins with lions on pedestals spouting water into the lower basin, which is 80 feet in diameter. At the south-west corner of the site are large ranges of cattle stalls (E and F), with stable courts, drinking troughs, etc. These buildings are handsome stone structures, two stories in height, the ground floor being used as stalls, and the upper story as a store for hay and food for cattle. The building G, on the eastern side of the cattle stalls, is used for sheltering milch cows. Between these buildings and the fountain, a large range of counting barriers (H) are arranged to facilitate checking the number of animals entering the markets from the Rue d'Allemagne. They consist of a series of parallel wooden barriers 4 feet in height, with lozenge-shaped enclosures in which the drovers and men who are counting the animals, stand. The building (I on plan) is used as a store for disinfectants, and also the necessary apparatus, hose, etc., for cleansing the markets. The work is thoroughly done, and a large staff of men are employed in the service. At the end of the day after the sales are completed, the animals are driven to their lairs, and the whole of the roads, markets and courtyards are thoroughly cleansed by means of standing hydrants, and the whole area covered with powdered disinfectants. Facing the fountain is the magnificent market for beasts (J), which measures about 767 feet by 280 feet, and covers an area of nearly five acres. A portion of the plan and one half elevation and section are shown on Fig. 22 As will be seen from the drawing, the building is constructed of iron and glass. The roof is supported by iron columns, on the upper portion of which brackets are fixed to support the lattice girders. The central portion of the roof is raised, and the space between it and the lower roof left open for the purpose of cross-ventilation. Additional ventilation is also obtained by the large dormers with fixed glass louvred openings, and also a similar arrangement is made at each end of the market. A central road about 30 feet wide, and two of similar widths at the sides, run the whole length of the market, whilst two smaller roads, each about 7 feet wide, are arranged between the cattle stalls. These latter are formed by iron posts 3 feet 3 inches high, and about 6 feet apart, with two iron circular rails connecting them, to the upper one of which the animals are tethered. The whole of the markets are paved with granite setts. Beyond this market is a large open space (planted with trees), and two restaurants and buffets (K), one for the cattle dealers and the other for the workmen.

Parallel with the central market, on the eastern side, is a smaller market (L)

for the sale of pigs and calves. The size of this building is about 280 feet by 450 feet, or nearly three acres in extent. A wide road runs longitudinally through the market, with many roads of lesser width on the right and left.

Four places are provided in this market for weighing the animals. The pens are divided by iron standards 33 inches high with square iron balusters between them. A small office for the veterinary inspectors is provided on the west side.

At the northern end of this market is an additional series of pens for pigs (M) with weighing table.

Beyond these pens is a large covered building (N) used as pig-styes, where the animals are kept between the time they are sold and killed.

On the western side of the central market at O is the market for sheep, similar in size to that for calves and pigs. Six wide roads cross the market longitudinally, and on each side of them the pens are arranged. They are constructed of iron posts 1 foot 10½ inches high and 2 inches in diameter, to which hurdles can be tied making the enclosures large or small as required.

The roads are constructed of granite setts and the floors of pens in cement. The three markets are similar in elevation and section, differing only in size. At P is a large open space fitted as sheep pens, and at Q an additional stall for cattle.

At the southern end of the markets is a long washing-pond (R) through which the animals can pass in the morning on their way to the markets. It is about 90 feet long and on either side there are platforms 2 feet wide, with hand-rails for the drovers. It is bounded by walls 4 feet 9 inches high, on the outside of which and extending the whole length of the pond are drinking troughs for the animals. The bottom of the pond slopes towards the centre, allowing at the deepest part 3 feet of water. At the southern end of the market for pigs and calves is a drinking-pond (S) octagonal in shape, and bounded by walls 5 feet high. The floor of this pond slopes towards the central division walls, and the water area varies from nothing to 3 feet in depth.

The building T is a handsome stone structure two stories in height. The rooms are grouped round two internal courts, and are used as offices for the various departments.

Placed symmetrically with the above is the building U, similar in size and design, used as a bank and city toll offices. The two small buildings V and W are restaurants.

On the eastern side of the market for pigs and calves are arranged a large group of counting barriers (X) for animals entering the markets from the railway. These are similar in construction to those previously described. Adjoining these barriers are (Y) offices for veterinary inspectors, and (Z) toll offices.

The small building A′ is the only slaughter-house on the southern side of

the canal, and is used for killing animals condemned as unfit for food, or for animals about which some doubt may exist. After slaughter these carcases are examined, and passed or condemned, wholly or in part.

The building B′ is used as offices for the veterinary staff, C′ as a weighing-house, D′ as a stable for condemned cattle and tool-shed, and E′ as offices for the railway company.

At F′ is a large stable, coach-house and pound for animals not claimed by the owners at the end of the market hours. Three large buildings are placed between the markets and the canal, each grouped round a central court with drinking troughs. G′ is for stabling calves, H′ and J′ for beasts, I′ for pigs, and K′ for sheep. The buildings are two stories in height, the upper one being used as forage and litter stores.

Another large building is placed at L′ and is used as stalls for beasts.

The yard M′ is for manure, and the long range of low buildings (N′ and O′) comprise weighing-office, stables, coach-house, sanitary conveniences, stores and private sheep pens.

The above complete the buildings on the southern side of the canal, and are all practically devoted to the sale and temporary stabling of live animals, and the necessary administrative offices, etc.

The Canal de l'Ourcq, with a wide towing path on either side, is spanned by two bridges P′, with stairs for foot passengers at Q′, and eight sloping roads R′ for animals and carts passing from the markets to the slaughter-houses. The four small buildings S′ are offices and stores.

The grand sanitorium T′ consists of an immense structure, in which are stabled the sheep arriving from Germany. At the entrance is a small enclosure U′ for the veterinary inspectors, who examine each animal as it passes through the barriers. The animals are then kept in the sanitorium some days before being killed, and frequently examined. An open court divides this building from V′, the lazaret and lairs for foreign cattle.

The refrigerating works W′ is a comparatively new and well designed building in stone with red tiled roof.

This is the only Government building on the site, and it is here that all the meat is frozen for consumption by the army.

The electricity works are placed at X′, are comparatively modern, and very pleasing in design. Here the current is generated to supply the whole of the electric lighting.

The tripery Y′ is fitted with a number of boilers and machines for preparing calves' feet, etc., and also for finally rendering intestines suitable for sale. These articles are first washed in a glass covered building at Z′. The small buildings

AA, BB, CC, are used for various purposes in connection with the tripery, and DD is a stable and coach house.

We now come to the large group of buildings for stabling the animals, killing them, and dressing the carcases.

They are divided by a wide central roadway (Avenue du Centre), and two roads of lesser width (Avenues du Nord and du Sud), whilst the blocks of lairs are separated from the slaughter-houses by transverse roads.

Fig. 23 shows a typical plan (FF on Fig. 21) in detail, of one range of cattle and sheep lairs, which are all arranged on the same principle, although differing in size. Between the lairs for cattle and sheep is a large courtyard 30 feet wide covered by an iron and glass roof, and with a drinking trough in the centre. It is here that the animals are kept, after leaving their lairs just previously to being slaughtered. The lairs are 33 feet wide and fitted with feeding troughs along the whole length of the walls. Cast iron columns support the fireproof floors between the lairs and the forage lofts over. These latter are approached by staircases at each end of the lairs. In the cattle lairs iron rings are fixed in the wall 3 feet apart, to which the animals are tethered, whilst the sheep lairs are divided by wooden partitions. The lairs for both cattle and sheep are lighted and ventilated by windows, the sills of which are 9 feet from the ground, the heads reaching nearly to the ceilings. They are paved in cement, and the waiting court in granite setts.

Between the ranges of lairs are blocks of buildings used as slaughter courts and cooling rooms (EE on Fig. 21) shown in detail on Fig. 23. The slaughter courts are 37 feet wide. Killing is carried on at each side of the court, and constitutes a weak point in the planning of these buildings, from the fact that some animals are necessarily standing near whilst their companions are being slaughtered. This arrangement, however, has been avoided at Vaugirard (La Rive Gauche). Sliding iron doors are provided at each end of the slaughter courts and the floor slopes towards the centre, where there is a channel to carry away the drainage. The cooling rooms are arranged on each side of the slaughter court, and are separated by brick walls with perforated brick panels in the upper portions. In Fig. 25 a view is shown of one of the killing courts. The cooling rooms are fitted with iron brackets on the wall for sheep, and with iron joists and wooden beams in the centre for beasts. In many of the rooms, additional stands are provided for the sheep carcases. The story over the cooling room is used for stores and tools. The buildings are in brick and stone with red tiled roofs, the eaves of which have a great projection and serve not only as a shelter for the workmen when carting the meat, but also to keep the rooms protected from the rays of the sun in summer. The slaughter courts are covered by an iron and glass roof, and are paved in granite setts. The floors of the cooling rooms are in cement,

At GG are the large styes for pigs. The buildings are two stories in height, the upper one being used for forage and litter (Fig. 26). The pig killing and burning house is an erection with 13 sides, and is placed at the end of the buildings for styes. It is divided into six compartments by dwarf brick walls. After the animals have been stunned, killed and bled, the carcases are placed on straw, which is ignited and the hair burnt off, the smoke ascending and escaping through the louvres in the large lantern at the apex of the roof. The carcases are then taken to the pig hanging hall II, where they are disembowelled, scraped and prepared. This is a very fine hall, and is shown on Figs. 27 and 28.

On either side of the hall are rooms for the preparation of intestines, which are fitted with an ample supply of troughs, sinks, etc.

At JJ are buildings occupying three sides of an open courtyard, and it is here that the work in connection with the preparation of blood for various purposes is carried on. Adjoining this is a building KK, in which skins receive the first treatment before being converted into leather.

At MM are cloak rooms and conveniences for women. It may be noted that a large number of women are employed in the bleeding and dressing of the carcases of pigs. The work is necessarily objectionable, and certainly in England should never be performed by others than males.

The clock tower NN, is placed centrally with the entrance gates from the Route de Flandres. At the base of this tower the number of animals "declared" each market day are posted.

To the north of the clock tower is the auction mart OO, which is an octagonal structure with four wing buildings, Fig. 29. It is comparatively small and most of the meat is carted away direct from the cooling rooms. On the opposite side is a building PP, somewhat similar in plan, used as police offices, ambulance station, veterinary inspectors' offices and club.

To the right and left on entering the gates are two two-storied buildings QQ and RR devoted to apartments for caretaker, city toll office, and general offices. At the entrance four weighing stalls have been provided for weighing meat as it is carted away. The small pavilions TT, UU, WW. and YY are offices for the city tolls.

The buildings SS and XX are used as merchants' offices, butchers' trade committee, labour bureau, etc.

A police station, fire brigade station, and rooms for the republican guard are at AAA. Private sheep lairs are at BBB, and tool-sharpening shed at CCC.

The buildings are very substantial and pleasing in design, and in all the main avenues trees have been planted which add considerably to the general effect.

The Abattoirs of Vaugirard (La Rive Gauche).

At the time of the erection of the abattoirs of La Villette it was anticipated that they would be sufficiently large to supply the wants of the whole of Paris, but experience proved this to be erroneous, so that the small abattoirs on the left bank were retained. In many respects they were defective, and in 1887 the Municipal Council decided to supersede them by one large establishment. In the same year the site was selected, and M. Ernest Moreau, honorary architect to the city of Paris, was appointed to prepare designs. These were eventually approved, and the work commenced in 1893.

It was then ascertained that the total consumption in Paris amounted annually to about 349,000 beasts, 226,000 calves, 1,751,000 sheep and 226,000 pigs, or about 2,552,000 animals in all. As the population of the left bank is about one quarter of the total population, it was then decided to erect the buildings of sufficient size to enable that proportion of work to be carried out. It may be interesting to note that the total computed number of animals required was approximately correct twenty years ago, but how greatly the proportion of the various kinds have altered may be seen in the following table:

—	Computed Number in 1887.	Actually Killed in 1906.	Percentage, about.
Beasts	87,250	50,818	41 per cent. less
Calves	56,550	55,538	approx. correct
Sheep	438,000	344,070	2½ per cent. less
Pigs	64,000	154,166	140 „ more
Total . . .	645,800	604,592	

From these figures it appears that, although on the left bank the consumption of veal during the last twenty years has remained stationary, a large decrease has taken place in the sale of beef and mutton, but an enormous increase in the consumption of pork.

At Vaugirard ample space is allowed for extension. The new abattoir for horses is not yet executed—the old one for horses, donkeys and mules still remaining. About 45,000 of these animals are killed annually.

The abattoirs of Vaugirard (La Rive Gauche) are most conveniently situated, surrounded on three sides by wide roads and on the southern side by the railway. The site covers an area of 25 acres, the buildings being divided broadly into three portions, viz. (1) the part devoted to beasts, calves and sheep, (2) for pigs, (3) for horses, donkeys, etc. Each of these parts is separate in

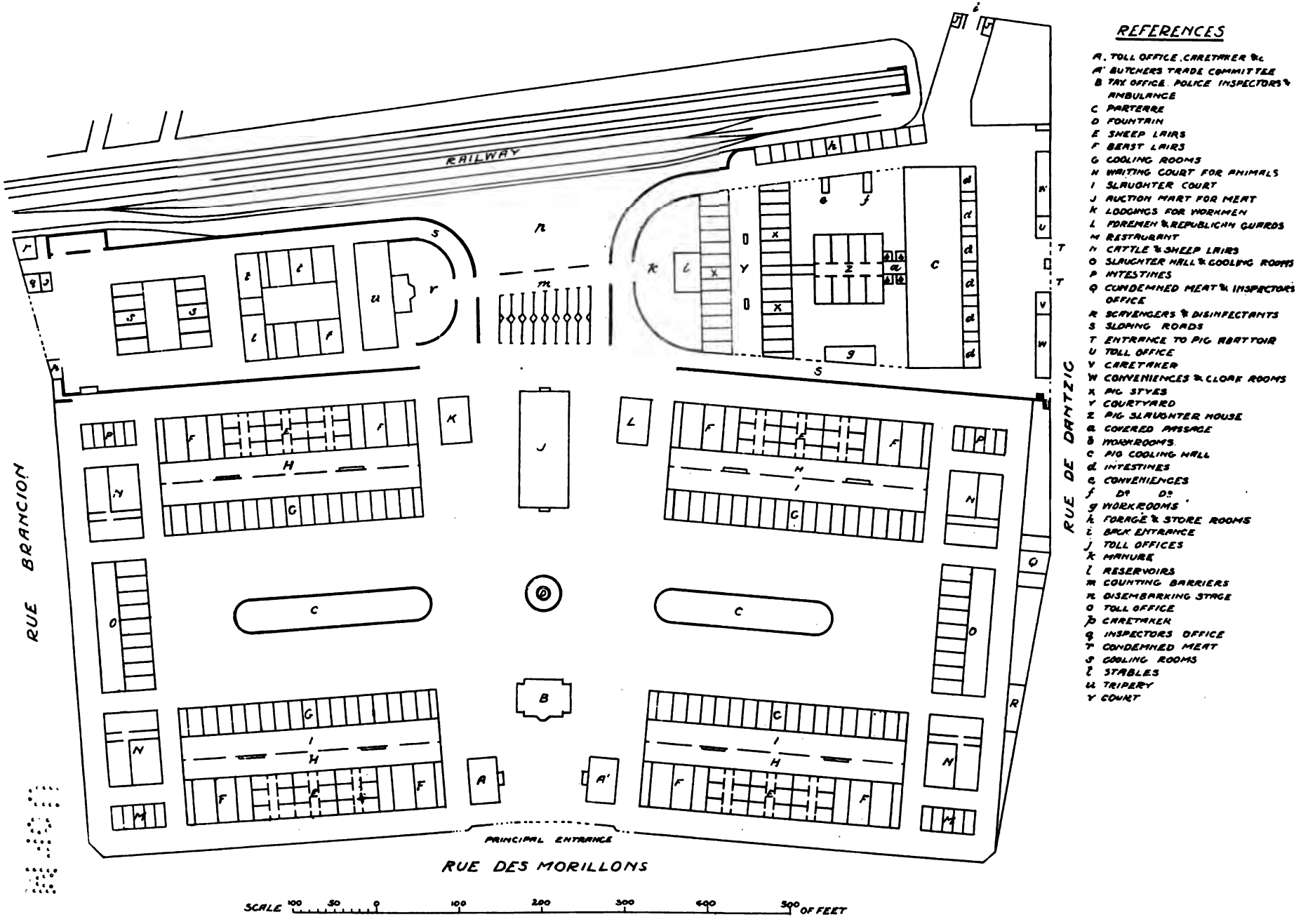

FIG. 30. VAUGIRARD (LARIVE GAUCHE.) PARIS. BLOCK PLAN.

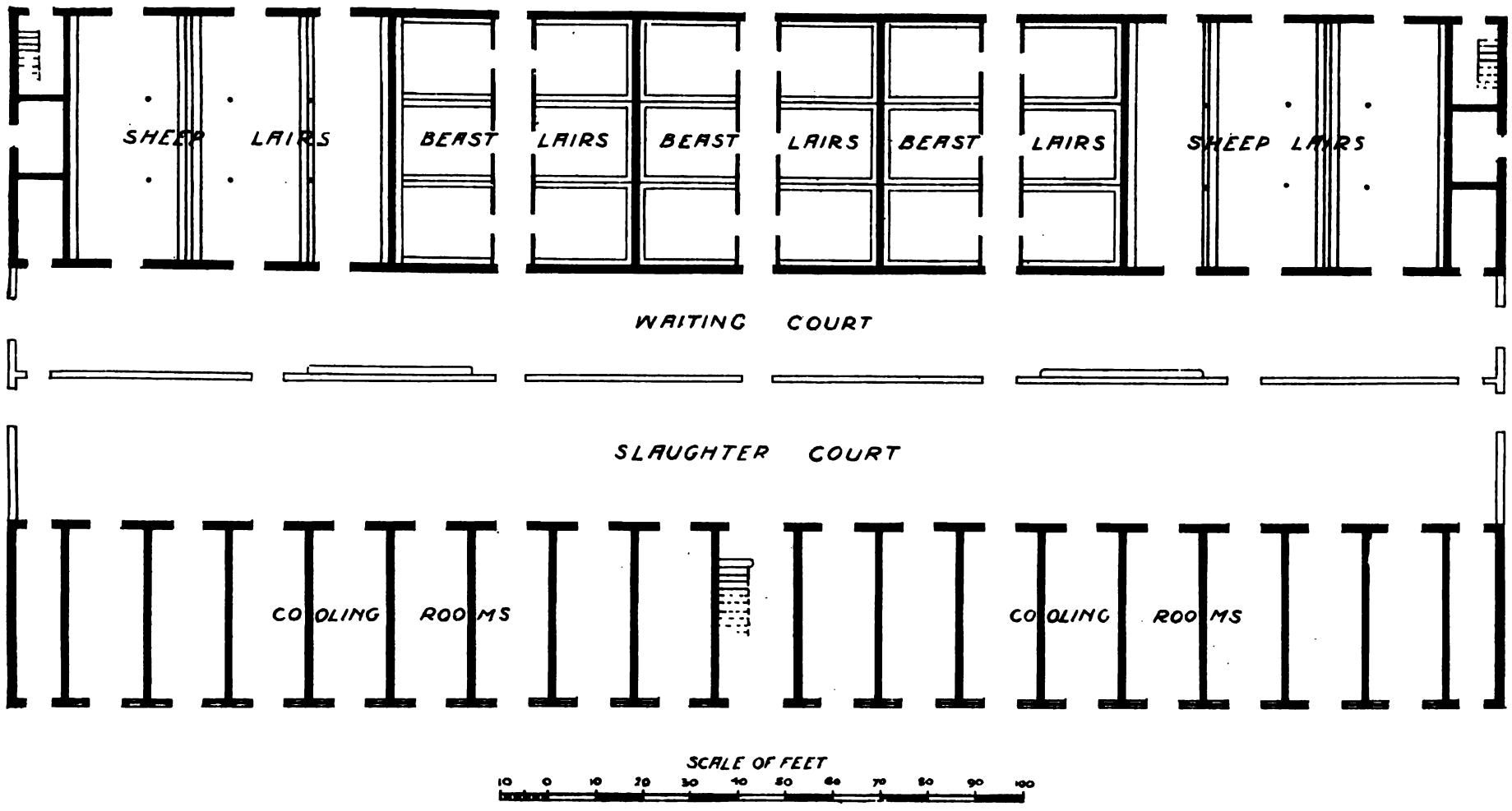

FIG. 31. VAUGIRARD (LA RIVE GAUCHE.) PARIS. PLAN OF LAIRS. WAITING & SLAUGHTER COURTS & COOLING ROOMS.

itself, with separate entrances from the streets in addition to the general main source of supply, the railway.

M. Moreau has endeavoured, and very successfully, to avoid some of the faults in planning at La Villette, which have been found from practical experience. (1) On account of the enormous area occupied by the cooling-rooms, many of them are necessarily a very long distance from the entrance. (2) The cooling rooms are placed, at La Villette, on each side of the slaughter courts, which have proved too narrow to enable animals to be killed on each side without crowding. (3) The lairs for beasts and sheep are in isolated buildings separated by roads from the slaughter-courts. This necessitates the animals being driven some considerable distance from the lairs to the place of slaughter. It will be noticed on Figs. 30 and 31 that these defects have been avoided at Vaugirard. (1) By grouping the cooling rooms round the great entrance courtyard, thus rendering access easy, and affording facilities for carting the meat. (2) By placing only one range of cooling rooms on the side of the slaughter court, which is approximately double the size of those at La Villette, as animals are only slaughtered on one side. (3) By separating the lairs from the slaughter hall by a wide covered courtyard in which the animals wait previously to being taken to the adjoining slaughter hall. This is an admirable arrangement, as it obviates the necessity of the animals having to traverse a long distance, and also enables the animals to be killed in batches and the place cleaned down, before other animals are brought in.

Abattoirs for Beasts, Calves and Sheep.—The entrances for this part are from the Rue des Morillons, and consist of six large gates for cartage and smaller gates for foot passengers. The piers are in masonry, surmounted by sculptured oxen.

On either side of the entrance gates are two buildings A and A′ used as offices for the butchers' trade committee, caretakers' residences, offices for the city tolls. Weighing-tables are provided on each side near the gates for checking the weight of carcases leaving the abattoirs.

Immediately opposite the central gates is the building B used as municipal toll offices, sanitary and veterinary inspectors' offices, police-station and ambulance corps.

Beyond these buildings to the right and left is an enormous open space, with a large fountain in centre and large pastures planted with trees on either side.

Round the open courtyard are the four blocks of buildings, each containing lairs, waiting court, slaughter court and cooling rooms. Fig. 31 shows a plan of one block in detail, the remaining three buildings being similar. In the centre of the block of lairs are placed the pens for sheep, with divisions making eighteen compartments. The dividing walls are formed of iron framing, the

lower half being filled in with half-brickwork cemented, and the upper work an open iron railing.

On each side of the sheep lairs are those for beasts, separated from each other by dwarf walls also cemented, and provided with hooks and rings to which the animals are tethered. Adjoining the lairs is a large waiting court, with drinking troughs, and kept well covered with litter (Fig. 33). This is not only a humane but utilitarian improvement on the planning at La Villette, as the animals have only to be taken through doors in the dividing wall 8 feet high, to reach the slaughter court. This court, like the waiting court, is well lighted and ventilated by a skylight and louvres the whole length of the building. By this arrangement the animals can be brought into the slaughter court separately, and can neither see their companions killed, nor smell blood. Much more space is available for working, as here the animals are only killed on one side of the court 29 feet wide, whilst at La Villette they are killed on each side of the court only 33 feet wide.

Eighteen cooling rooms G are placed in each block adjoining the slaughter courts, with a loft over for forage and litter, approached by a staircase in the centre.

The plan gives to each of the four blocks of butcheries equal importance, a large surface for circulation and cartage, and all are equally accessible and fully in view.

Sanitary conveniences and stairs for access to the lofts over the lairs, are placed at the ends of the buildings. The waiting and slaughter courts are spanned by an iron glass roof. The buildings are in brick with stone dressings and red tiled roofs, and the whole of the floors are in cement.

Facing the fountain, and in the centre of the site, is the auction market J for the sale of meat. It has a basement under the whole building for the storage of carcases, and at the end nearest the entrance gates is a well designed clock tower.

A sketch view of the auction mart, tower, fountain and block of lairs, slaughter court and cooling room, is shown on Fig. 34. The auction mart is well lighted by a series of windows above the covered verandahs on the two long sides, and is provided with a series of interior fittings, on which the carcases are exposed for sale. On the side of the market are two buildings, K and L, the former being residences for employés, and the latter, fire-station and station for the republican guard.

The scheme embraces the following buildings shown on the block plan (Fig. 30): residences for employés M, additional cattle and sheep lairs and waiting courts N, additional killing courts and cooling rooms O, workrooms for the preparation of the intestines P, condemned cattle and sanitary inspector Q, scavengers and disinfectants R.

Owing to the inequalities of the site, the buildings for pigs and horses are

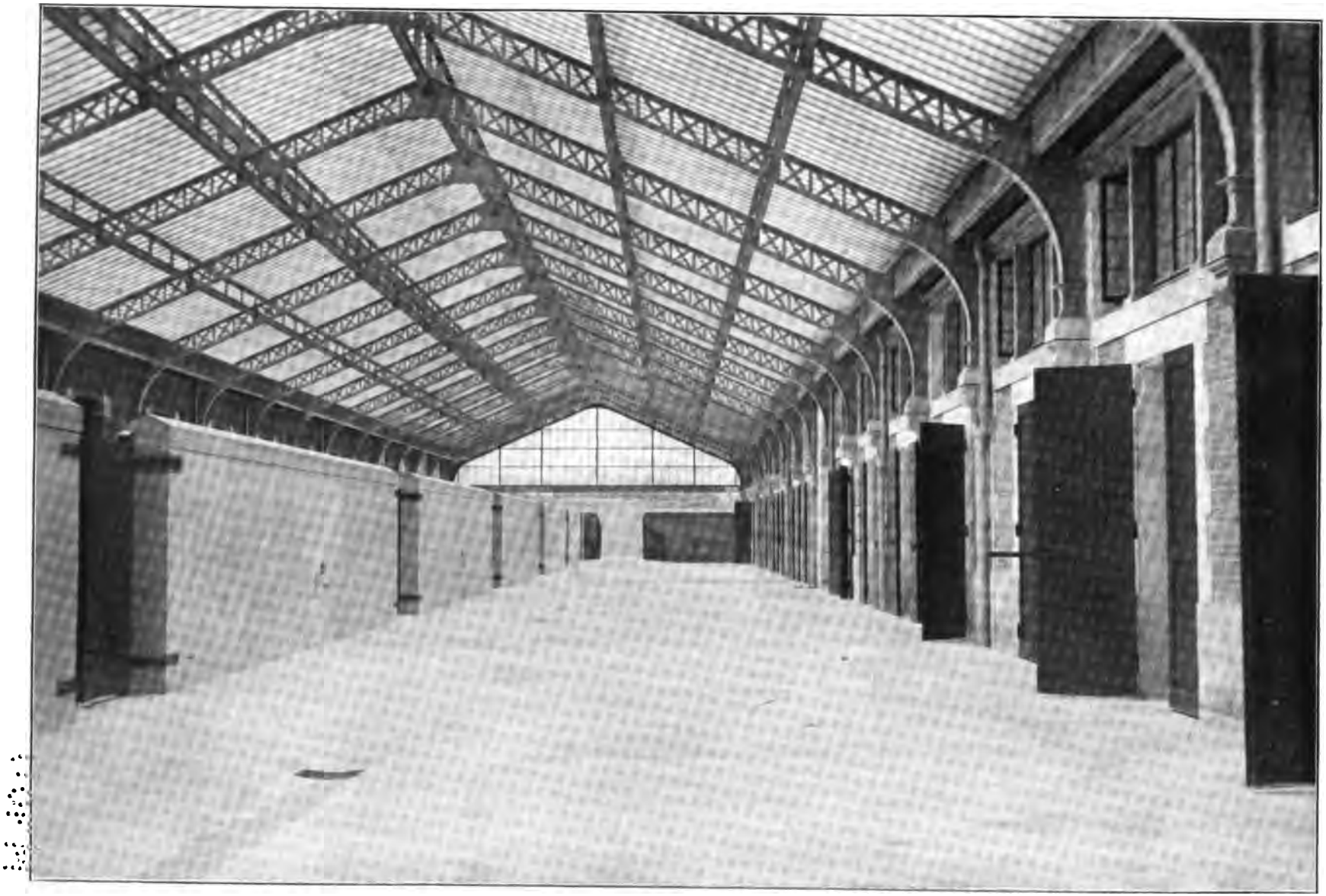

FIG. 32.—VAUGIRARD (LA RIVE GAUCHE). VIEW OF WAITING COURT.

FIG. 33.—VAUGIRARD (LA RIVE GAUCHE). VIEW OF TOWER, AUCTION MART, FOUNTAIN, ETC.

placed on a terrace about 16 or 17 feet above the general level, and are approached by sloping roads SS.

Abattoir for Pigs.—The entrances for animals brought to the abattoir on foot or in carts are in the Rue de Dantzig (T), and consist of two carriage and two side gates. To the right of these entrances are two pavilions U and V, the former being used by the caretaker, and the latter as an office for city tolls. Between the large gates is a covered weighing house.

Two long ranges of cloak rooms and conveniences are situated at W.

The three large pig styes X are divided into 27 pens, and are capable of stabling 1200 animals. Between the ranges of styes is a large court about 40 feet wide, with sloping platforms to enable the animals to dismount from the carts. Connected to the lairs is the killing and burning hall Z. This is divided into eight compartments by dwarf brick walls. The animals are brought into these divisions about six or eight at a time, are stunned, killed, and the hair burnt off the carcases. The planning of this portion is not so satisfactory as those for beasts and sheep, when each animal is killed out of sight of the others.

A short passage *a*, with workrooms *b* on either side, connects the slaughter hall with a very fine hall for further preparing the carcases. Six large rooms *d*, for the preparation of intestines, are arranged on one side of the hall, fitted with troughs, work tables, etc. In the large open courts are placed, at *e* and *f*, conveniences for men and women, and at *g*, a range of workrooms. At *h* is a large store for forage and litter. An additional entrance *i*, with offices for the city tolls *j*, are arranged at the extremity of the site. On the lower level a large courtyard *k* is used for manure, and at *l* reservoirs are built over an open arcade. Adjoining the railway at *n*, is the disembarking stage for animals brought by train, and at *m* the counting barriers similar in arrangement to those at La Villette.

Abattoirs for Horses.—The entrance to this portion of the scheme is from the Rue Brancion, and, when built, will comprise an office for city tolls *o*, caretaker's office, etc. *p*, veterinary inspector's office *q*, and a depot for condemned meat *r*.

At *s*, a large slaughter hall with nine cooling rooms has been arranged. Stabling has been provided at *t*, with a large courtyard and drinking trough in the centre. A large tripery is arranged at *u*.

As will be seen from the illustrations, the whole of the buildings are treated architecturally, simple in design and pleasing in detail. By a judicious use of material M. Moreau has obtained an effect which compels admiration. It is a striking example of the way in which strictly utilitarian buildings can be designed, not only expressing their use, but at the same time excellent examples of architecture.

CHAPTER XI.

CONCLUSION.

In the foregoing chapters I have endeavoured to prove that public abattoirs are a necessity. The few existing institutions of the kind, scattered over the Kingdom, merely minimise to a trifling degree the evils of the private slaughter-houses. In England to-day we have roughly, one public abattoir to each 244,000 inhabitants. And, when it is considered that two-thirds of these abattoirs each cost less than 7000*l.* to erect and equip, it is obvious that we have not even touched the fringe of any definite "system." Indeed, many of the public abattoirs included in the above, can only be so called by courtesy, as the capital expended has been considerably under 1000*l.*

It is a little difficult to know why we have moved so slowly. Other nations have had to contend with, and successfully overcome, the opposition of the butcher and ratepayer, the former fearing loss of profit, and the latter increased taxes. Both of these evils, however, are non-existent. The butcher selling foreign meat as English would doubtless be at a disadvantage, but the honest man would gain by the elimination of a dishonest trade rival. In Chapter VI. it has been shown that public slaughter-houses, can be, and should be made self-supporting or profitable, throughout the country. That the public slaughter-house system would give an enormous impetus to the work of the agriculturalist, cattle breeder and dealer, is beyond doubt.

England to-day is one of the very few civilised nations which has practically ignored the subject.

In Germany and France, public abattoirs are general, or rapidly becoming so; Belgium has such institutions in all large and many small towns; whilst in Switzerland public slaughter-houses are provided in nearly every town with more than 2000 inhabitants.

It was intended to include in this volume a typical plan of a public slaughter-house suitable for a small city and designed on the lines advocated. But so many important factors have to be taken into account in each case, that such a scheme would probably be misleading. The area of the district to be served, the population, number of competing private slaughter-houses, railway accommodation, and

other innumerable details, must all be carefully considered. A scheme perfectly suitable for one town would probably be quite impracticable for another with the same population.

Undoubtedly legislative measures are necessary before any radical improvement can be effected. At intervals the subject is brought up in the House of Commons, but with no tangible result.

In April 1907, Mr. G. Greenwood, M.P. (one of the most enthusiastic slaughter-house reformers) and Mr. Arthur Lee, M.P. put the following questions.

Mr. George Greenwood (Peterborough): I beg to ask the Secretary of State for the Home Department if the Government will bring in legislation in order to carry out the unanimous recommendations of the Committee appointed by the Admiralty in 1904, to consider the humane slaughtering of animals?

Mr. John Burns: My right hon. friend has asked me to reply to this question. I will give consideration to the subject, but I cannot promise to introduce legislation with regard to it during the present session.

Mr. G. Greenwood: Will the Government give facilities for Lord Donoughmore's Bill, which has passed its second reading in another place with the support of the President of the Board of Agriculture, to enable the authorities to establish public slaughter-houses?

Mr. John Burns: I will consider that.

Mr. Arthur Lee (Hampshire, Fareham): Will the right hon. gentleman, in view of the state of business, consider the desirability of issuing a circular to local bodies calling attention to the unanimous recommendations of this Committee?

Mr. John Burns: I shall be pleased to consider that suggestion sympathetically, knowing that the hon. gentleman has taken special interest in this matter. May I add that the report with which his name is associated, has advanced the subject very much more than he may be disposed to think.

In 1899, the Public Health Committee of the L.C.C. reported: "that as a first step towards insuring the proper inspection of meat, private slaughter-houses should cease to exist," and a like decision was come to at a conference of sanitary authorities at the County Hall in July 1904. As over 300 private slaughter-houses exist in London to-day, the "first-step" has been a remarkably infantile one.

Public abattoirs are essential for the bodily health of the nation, not only in towns and cities but in rural districts, where animals are slaughtered and the carcases conveyed to, and sold in densely populated districts, with practically no inspection.

They are essential on grounds of humanity. Animals killed for food should be slaughtered as expeditiously and as painlessly as possible. This is only

practicable in suitable buildings where well-trained men are employed as slaughterers, and well-trained officials are supervising the work.

They are desirable on the grounds of economy, to minimise the prodigious waste of valuable material which daily takes place, owing to our want of system.

One can only hope that in the near future public slaughter-houses will become universal throughout the country, and that we shall follow the excellent example of Germany, where, as Sir Shirley Murphy stated a few years ago, they were "springing up like mushrooms," and are still being erected all over the country.

APPENDIX A.

SEIZURE AND CONDEMNATION OF TUBERCULOUS MEAT.

LOCAL GOVERNMENT BOARD,
WHITEHALL, S.W.
7th September, 1904

Sir,

I am directed by the Local Government Board to state that they have had under consideration the report of the Select Committee of the House of Commons on Tuberculosis (Animals) Compensation Bill 1904, in which reference is made (*a*) to the variety of practice alleged to exist with regard to the amount of tubercular deposit, the existence of which in a carcase is held to justify its total condemnation; and (*b*) to complaints made by butchers as to injury caused to them by their prosecution in open court for having tuberculous meat upon their premises.

With regard to (*a*) it appears to the Board to be most desirable that there should be uniformity in the practice of Meat Inspectors in dealing with the carcases of cattle; and they have already on two occasions, viz. in their circular letters of the 11th March, 1899, and the 6th September 1901 set out, and urged the observance of, the principles laid down by the Royal Commission on Tuberculosis in their report of 1898 with respect to the degree of tubercular disease which should cause a carcase, or part thereof, to be seized. The Royal Commission stated as follows:—

"We are of opinion that the following principles should be observed in the inspection of tuberculous carcases of cattle:—

(*a*) When there is miliary tuberculosis of both lungs. (*b*) When tuberculous lesions are present on the pleura and peritoneum. (*c*) When tuberculous lesions are present in the muscular system, or in the lymphatic glands imbedded in or between the muscles. (*d*) When tuberculous lesions exist in any part of an emaciated carcase.	The entire carcase and all the organs may be seized.
(*a*) When the lesions are confined to the lungs and the thoracic lymphatic glands. (*b*) When the lesions are confined to the liver. (*c*) When the lesions are confined to the pharyngeal lymphatic glands. (*d*) When the lesions are confined to any combination of the foregoing, but are collectively small in extent.	The carcase, if otherwise healthy, shall not be condemned, but every part of it containing tuberculous lesions shall be seized.

The Board are of opinion that, at the present time, measures more stringent than those advocated by the Royal Commission are not called for, but they would impress upon the

Council the expediency and desirability of insisting upon those of their officers who are employed as Meat Inspectors acting in strict accordance with the principles thus laid down, if this is not already the case.

With regard to (*b*) the Select Committee express their view that, if a butcher who is in possession of tuberculous meat has notified the fact to the proper authority as soon as he could be reasonably expected to be aware of it, the case should not be taken into the Court.

The Board understand that in some districts the course recommended by the Committee is followed now, but where this is not so the Board suggest that, having regard to the serious consequences which may result to a butcher from prosecution in open court for being in possession of tuberculous meat, the Council should act upon the view expressed by the Select Committee in cases where such possession is voluntarily and promptly disclosed by the owner.

I am, Sir,
Your obedient Servant,
S. B. PROVIS,
Secretary.

The Town Clerk, or
Town Clerk to the Urban District Council, or
Rural District Council.

APPENDIX B.

WITHIN the last few days (March 1908), the Local Government Board has issued a circular to the councils of boroughs, and urban and district councils, through their town clerk or clerk. This document is to a large extent an epitome of the recommendations of the "Humane Slaughtering" commissioners. It will be noted that the circular states that "attempts at stunning, carelessly or unskilfully made, may be the means of inflicting instead of avoiding unnecessary pain." This is doubtlessly true, but in the public abattoir it is the duty of the veterinary inspector to prevent the employment of either unskilful or careless slaughterers.

The following is a copy of the circular :—

Councils of Boroughs, and of
Urban and Rural Districts.

THE HUMANE SLAUGHTERING OF ANIMALS.

LOCAL GOVERNMENT BOARD,
WHITEHALL, S.W.
20th March, 1908.

Sir,

I am directed by the Local Government Board to state that they have recently had under consideration the question of the slaughtering of animals in slaughter-houses in connection with the Report* of the Committee appointed by the Admiralty upon the subject of the Humane Slaughtering of Animals, and they think it may be desirable to draw the attention of the Council to the subject and especially to certain recommendations made by that Committee as to methods of slaughter. Under the terms of the reference the investigations by the Committee related to the following animals, viz., cattle, calves, sheep, lambs and pigs.

The Committee suggested the universal enforcement of the following regulations:—

"(*a*) All animals, without exception, must be stunned, or otherwise rendered unconscious, before blood is drawn ;

(*b*) Animals awaiting slaughter must be so placed that they cannot see into the slaughter-house, and the doors of the latter must be kept closed whilst slaughtering is going on ;

(*c*) The drainage of the slaughter-house must be so arranged that no blood or other refuse can flow out within sight or smell of animals awaiting slaughter, and no such refuse shall be deposited in proximity to the waiting-pens ;

(*d*) If more animals than one are being slaughtered in one slaughter-house at the same time, they must not be within view of each other ;

(*e*) None but licensed men shall be employed in or about slaughter-houses."

* Parliamentary Paper [Cd. 2150], 1904.

Many urban district councils, and some rural district councils possessing the necessary powers have, under the provisions of the Public Health Act 1875, made a byelaw for preventing cruelty in slaughter-houses. This byelaw is usually based on one of the Board's Model Byelaws, which provides :—

> "Every occupier of a slaughter-house and every servant of such occupier and "every other person employed upon the premises in the slaughtering of cattle shall, "before proceeding to slaughter any bull, ox, cow, heifer, or steer, cause the head of "such animal to be securely fastened so as to enable such animal to be felled with as "little pain or suffering as practicable, and shall in the process of slaughtering any "animal use such instruments and appliances and adopt such method of slaughtering "and otherwise take such precautions as may be requisite to secure the infliction of "as little pain or suffering as practicable."

Whilst this byelaw is intended to secure the humane slaughtering of animals it does not require "stunning in all cases" as recommended by the Committee. The Board think that byelaws requiring animals to be stunned before slaughter may be made both under the first paragraph of Section 169 of the Public Health Act 1875, as regards slaughter-houses provided by a local authority, and under Section 128 of the Towns Improvement Clauses Act 1847, as incorporated by the second paragraph of that Section, for the regulation of private slaughter-houses, and they are prepared to consider applications for the confirmation of such byelaws.

It must, however, be remembered that attempts at stunning, carelessly or unskilfully made, may be the means of inflicting, instead of avoiding, unnecessary pain, and hence the Board suggest that, before making a byelaw requiring the stunning of any animals other than horned cattle, the local authority should ascertain how far the butchers in the district are prepared to carry out the practice. In relation to this question the Board have been advised by the Board of Agriculture and Fisheries that they would see no objection to a byelaw requiring the stunning of pigs or calves, but that the stunning of sheep is a difficult operation, in the carrying out of which cruelty might easily occur. On the other hand the Admiralty Committee satisfied themselves that sheep can be stunned expeditiously and without difficulty, by striking them on the top of the head between the ears—not on the forehead—with a small club having a heavy head; and they state that in Denmark, many parts of Germany, and Switzerland, the law requires that sheep shall always be stunned previous to being stuck. But while the practice of stunning sheep may be a proper one to adopt in public abattoirs, where it will be carried out by skilled slaughtermen, the Board doubt whether it is advisable to require its adoption in private establishments unless there is reasonable ground for believing that it will be properly performed.

In some cases it may be necessary to include in such a series of byelaws a provision allowing the Jewish method of slaughter. The Board have recently confirmed the following byelaw for the Corporation of Liverpool :—

> "No person shall proceed to slaughter any bull, ox, cow, heifer, calf or pig, until "the same shall have been effectually stunned.
>
> "Provided that this requirement shall not be deemed to apply to any member of "the Jewish faith, duly licensed by the Chief Rabbi as a slaughterer, when engaged "in the slaughtering of cattle intended for the food of Jews according to the Jewish "method of slaughtering, if no unnecessary suffering is inflicted."

In connection with the recommendations (*b*), (*c*) and (*d*), the Committee observe :—

"The animals awaiting slaughter should be spared as far as possible from any "contact with the sights or smells of the slaughter-house itself.

"There is no point which the Committee have more carefully investigated than "the question as to whether animals do or do not suffer fear from this contact, and "the evidence of those best qualified to judge is so conflicting that no absolute verdict "can be given. As an animal cannot speak it is impossible to accurately determine "to what extent it does or does not suffer from fear, but there is no doubt that cattle, "especially, frequently show great reluctance to entering the slaughter-chamber, and "can only be dragged in by the employment of considerable force. The presumption "is that what they chiefly object to is the smell of blood, but whether this can be proved "or not, it is obviously undesirable from a purely business standpoint, to run any risk, "as it appears to be an established fact that the flesh of an animal killed whilst in a "state of fear or excitement, loses some of its palatable and marketable qualities.

"Apart from this, the question is of such vital importance from the standpoint of "humanity, that it seems clear that the animal should be given the full benefit of the "doubt.

"With this object in view, the waiting-pens should be separated from the slaughter-"chamber, and the latter should be shut off by sliding doors.

"It is also of great importance that the pitch of the floor, and the drainage of the "slaughter-chamber, should be away from, and not run into, the waiting-pens, as is often "the case at present. The common practice of depositing blood barrels, freshly "removed hides, or refuse from the slaughter-house in close proximity to the waiting-"pens should also be prohibited . . . Cattle should, when possible, be slaughtered "screened off from their fellows."

When public slaughter-houses have been provided by a local authority under the powers contained in section 169 of the Public Health Act, 1875, or similar powers in local Acts, the authority could probably in most cases give effect to the recommendations of the Committee just referred to. The local authority have direct control over the structure and arrangement of the slaughter-house, and they have power to make byelaws with respect to the management of the slaughter-house.

In the case of private slaughter-houses there is more difficulty in providing for these matters under the limited powers of control which may be derived from section 128 of the Towns Improvement Clauses Act 1847, as the Board do not think that it would be permissible to include in a byelaw framed for preventing cruelty, requirements directly affecting the structure of the premises. But if the local authority are of opinion that a clause or clauses on the subjects dealt with in paragraphs (*b*), (*c*) and (*d*) can be enforced without infringing this principle, the Board would be willing to consider any proposal laid before them. They may say that they have in some recent cases allowed a byelaw prohibiting an occupier of a slaughter-house from causing or allowing any animal to be slaughtered, or its carcase to be dressed after slaughter, within the view of any other animal.

With respect to the recommendation (*e*), the Board may state that there is no power in the general law enabling a local authority to license slaughterers and to prohibit any person who has not a licence from slaughtering. The object of recommendation (*e*) cannot therefore be directly attained at the present time, but local authorities may be able to some extent to secure employment of properly qualified slaughterers, especially where they have the management of public slaughter-houses.